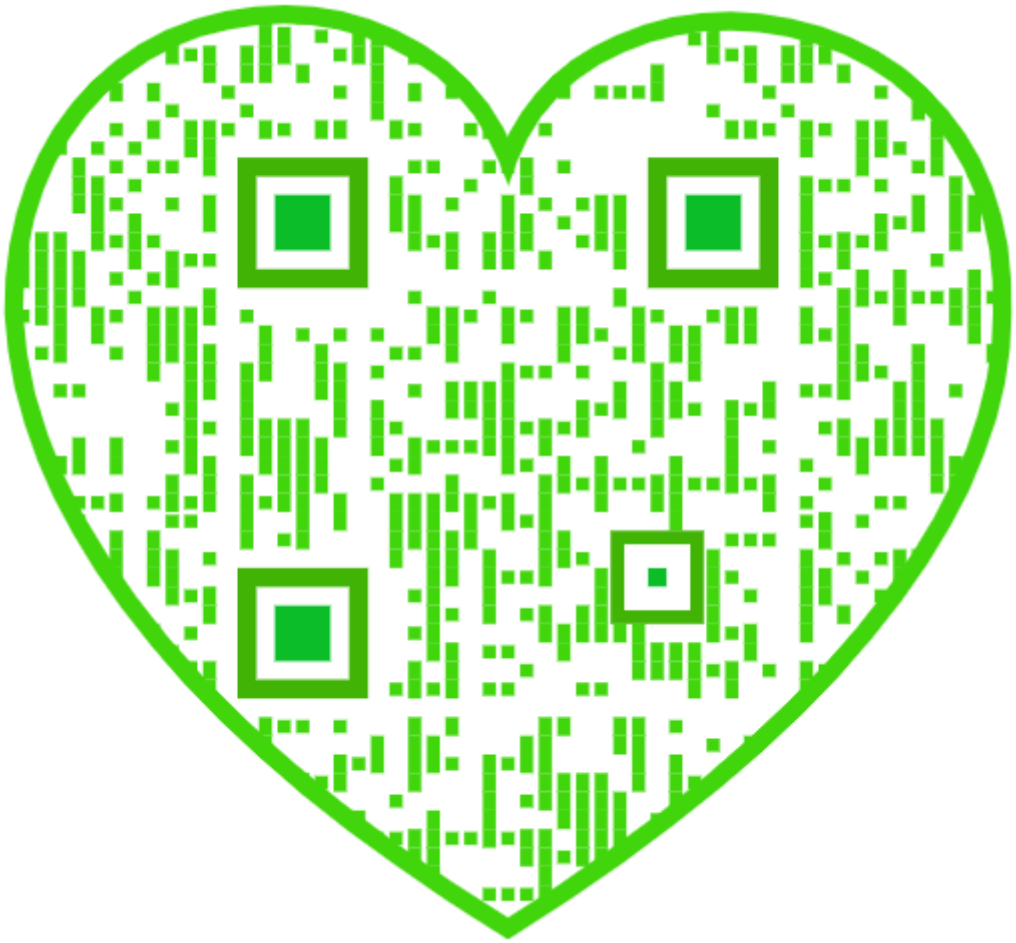

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Trus-Con Par-Seal, made by Trussed Concrete Steel Co., Youngstown, O.

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Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.

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- Monson Bros., 1907 Bryant St., San Francisco.
- Robert Trost, 26th and Folsom Sts., San Francisco.
- Western Building & Engineering Co., 455 Phelan Bldg., San Francisco.
- Williams Bros. & Henderson, Holbrook Bldg., San Francisco.

CORK FLOORING
- "Linotile," manufactured by Armstrong Cork & Insulation Company. M. C. Van Fleet, agt., 120 Jessie St., San Francisco.

CORNER BAR
- Dolbear Curb Bar, manufactured by American Steel Bar Co., 1034 Merchants Exchange Bldg., San Francisco.

CORNER BEAD
- Capitol Sheet Metal Works, 1827 Market St., San Francisco.
- United States Metal Products Co., 525 Market St., San Francisco.; 750 Keller St., San Francisco.

CRUSHED ROCK
- Grant Gravel Co., Flat Iron Bldg., San Francisco.
- Niles Rock, sold by California Building Material Company, new Call Bldg., San Francisco.
- Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
- Pratt Building Material Co., Hearst Bldg., San Francisco.

DAMP-PROOFING COMPOUND
- Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.
- Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.

DAMP-PROOFING COMPOUND—Continued.
- Imperial Co., 183 Stevenson St., San Francisco.
- Trus-Con Damp Proofing. (See advertisement of Trussed Concrete Steel Company for Coast agencies.)
- "Pabco" Damp Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
- Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
- McCabe Hanger Mfg. Co., New York, N. Y.
- Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
- Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Portland Wire & Iron Works.

DRINKING FOUNTAINS
- Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
- Crane Company, San Francisco, Oakland, and Los Angeles.
- J. B. Clow & Son, Hearst Bldg., San Francisco.
- Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
- Spencer Elevator Company, 173 Beale St., San Francisco.
- Burdett-Rowntree Mfg. Co., Underwood Bldg., San Francisco.

ELECTRICAL CONTRACTORS
- Butte Engineering Co., 683 Howard St., San Francisco.
- Boynton Electric Co., 504 Rialto Bldg., San Francisco.
- Central Electric Co., 618 Mission St., San Francisco.
- Newbery Electrical Co., Humboldt Bank Bldg., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
- H. S. Tittle, 245 Minna St., San Francisco.
- Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS
- Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
- The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
- Otis Elevator Company, Stockton and North Point, San Francisco.
- Spencer Elevator Company, 126 Beale St., San Francisco.
- Pacific Gurney Elevator Co., 186 Fifth St., San Francisco.
- B. C. Van Emon Elevator Co., 235 First St., San Francisco.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
- Elevator Supply & Repair Co., Underwood Bldg., San Francisco

MORTENSON CONSTRUCTION CO.

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Fibrestone & Roofing Company

Telephone Sutter 329 971 Howard St., SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELEVATOR ENCLOSURES
J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

ENGINEERS
W. W. Breite, Clunie Bldg., San Francisco.
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

ESTIMATORS
Alfred Alt, 335 Eighth St., Oakland.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., Underwood Bldg., San Francisco.

EXCAVATING CONTRACTORS
Pacific Excavator Company, Builders' Exchange, Oakland.

FIRE EXIT DEVICES
Russell & Erwin Mfg. Co., Commercial Bldg., San Francisco.

FIRE ESCAPES
Burnett Iron Works, Fresno, Cal.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIREPROOF PAINT
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. H. Andrews, 728 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison streets, San Francisco.
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLAG POLES—TACKLE, ETC.
Pacific Foundry Company, Harrison and 18th Sts., San Francisco.
Bolander & Hallawell, 270 First St., San Francisco.

FLAG POLE TOPS
Bolander & Hallawell, 270 First St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., San Francisco.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

GAS FURNACES
Cole Gas Furnace, Fisher & Klauser, distributors, Lick Bldg., San Francisco, 1764 Broadway, Oakland.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.

GARDEN FURNITURE
G. Tomagnini & Co., 219 Tenth St., San Francisco.

GAS GENERATORS
Utility Gas Generator Co., 340 Sansome St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier-Coburn Co., Howard & Beale Sts., San Francisco.

GRADING CONTRACTORS
Pacific Excavator Company, Builders' Exchange, Oakland.

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Division and Potrero Sts., San Francisco.
McGilvray-Raymond Granite Co., 634 Townsend St., San Francisco.

GRAVEL, SAND AND CRUSHED ROCK
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
American Keene Cement Co., 333 Monadnock Bldg., San Francisco.

HARDWARE
Corbin Hardware sold by Baker & Hamilton, San Francisco and Los Angeles.
Russwin Hardware, Joost Bros., San Francisco.
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.
Russell & Erwin Manufacturing Co., Commercial Bldg., San Francisco.

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD FLOORING
- Parrott & Co., 320 California St., San Francisco
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Strable Manufacturing Company, Oakland, California.

HARDWOOD LUMBER
- Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
- Parrott & Co., 320 California St., San Francisco.
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Strable Manufacturing Company, Oakland, California. (See advertisement above.)

HEATERS—AUTOMATIC
- Pittsburg Water Heater Co., 237 Powell St., San Francisco.
- Hoffman Heater Company, 397 Sutter St., San Francisco.

HEATING AND VENTILATING
- American Heat & Power Co., Oakland, Cal.
- Fess System Co., 220 Natoma St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Mangrum & Otter, Inc., 507 Mission St., San Francisco.
- Charles T. Phillips, Pacific Building, San Francisco.
- M. & W. Rotary Oil Burner, manufactured by Industrial Equipment Co., 527 Howard St., San Francisco.
- William P. Wilson Co., 328 Mason St., San Francisco.
- Scott Company, 243 Minna St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
- Petersen-James Co., 730 Larkin St., San Francisco.
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.

HEAT REGULATION
- G. E. Witt Company, Inc., 850 Howard St., San Francisco.
- Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
- Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento, and Chamber of Commerce Bldg., Portland.

HOSPITAL FIXTURES
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.

INGOT IRON
- "Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
- Robert W. Hunt & Co., 251 Kearny St., San Francisco.

JOIST HANGERS
- Western Builders' Supply Co., 155 New Montgomery St., San Francisco.

KEENE CEMENT
- American Keene Cement Co., Monadnock Bldg., San Francisco.

LAMP POSTS
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.

LIME
- Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.

LIGHT, HEAT AND POWER
- Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Sunset Lumber Co., Oakland, Cal.
- Santa Fe Lumber Co., Seventeenth and De Haro Sts., San Francisco.
- E. K. Wood Lumber Company, East Oakland, California.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
- Tilden Lumber Company, foot of Unversity Ave., Berkeley, Cal.
- Van Arsdale-Harris Lumber Company, Fifth and Brannon Sts., San Francisco.

MILL WORK
- Dudfield Lumber Co., Palo Alto, Cal.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.

MAIL CHUTES
- Cutler Mail Chute Co., Rochester, N. Y. (See Adv. on page 28 for Coast representatives.)

MANTELS
- Mangrum & Otter, 561 Mission St., San Francisco.

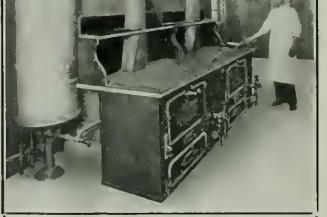
MARBLE
- G. Tomagnini & Co., 219 Tenth St., San Francisco.
- Sculptor's Workshop. (See adv., page 134.)

METAL AND STEEL LATH
- "Steelcrete" Expanded Metal Lath, sold by Holloway Expanded Metal Company, Second and Federal Sts., San Francisco.

METAL CEILINGS
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
- U. S. Metal Products Co., 525 Market St., San Francisco.
- Capitol Sheet Metal Works, 1927 Market St., San Francisco; 117 Franklin St., Oakland.

METAL FURNITURE
- Capitol Sheet Metal Works, San Francisco and Oakland.
- A. H. Andrews Co., 728 Mission St., San Francisco.



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ARCHITECTS' SPECIFICATION INDEX—*Continued*

METAL SHINGLES
- Meurer Bros., 630 Third St., San Francisco.
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

OIL BURNERS
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- American Standard Oil Burner Co., Seventh and Cedar Sts., Oakland.
- W. S. Ray Manufacturing Company, 218 Market St., San Francisco.
- Fess System Co., 220 Natoma St., San Francisco
- M. & W. Oil Burner, manufactured by Industrial Equipment Co.,
- T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
- Rotary Oil Burner Company, 159 Twelfth St., Oakland.
- G. E. Witt Oil Burner Company, 850 Howard St., San Francisco.

ORNAMENTAL IRON AND BRONZE
- Brode Iron Works, 31-37 Hawthorne St., San Francisco.
- Burnett Iron Works, Fresno.
- Palm Iron & Bridge Works, Sacramento.
- J. G. Braun, Chicago and New York.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Shreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.
- Vulcan Iron Works, San Francisco.

PAINTING AND DECORATING
- D. Zelinsky, 564 Eddy St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). (See Adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Trus-Con Stone Tex., Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Concreto Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Trus-Con Bar-Ox, Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Bay State Steel Protective Coating. (See page 30 for coast agents.)
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, represented in San Francisco by Marion D. Cohn Co., Hansford Building.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.
- Jones-Duncan Paint Co., 414 Ninth St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 113 Front St., San Francisco.

PHOTO ENGRAVING
- California Photo Engraving Co., 121 Second St., San Francisco.

PHOTOGRAPHY
- R. J. Waters Co., 717 Market St., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- Pacific Sewer Pipe Co., I. W. Hellman Bldg., Los Angeles.
- Pratt Building Material Co., Hearst Bldg., San Francisco.
- Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PLASTER CONTRACTORS
- A. Knowles, 985 Folsom St., San Francisco.
- C. C. Morehouse, Crocker Bldg., San Francisco.
- Hermann Bosch, 2054 Market St., San Francisco.

PLUMBING CONTRACTORS
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Petersen-James Co., 730 Larkin St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Alex Coleman, 706 Ellis St., San Francisco

PLUMBING FIXTURES, MATERIALS, ETC.
- J. B. Clow & Son, Hearst Bldg., San Francisco.
- Crane Co., Second and Brannan Sts., San Francisco.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Miller-Enwright Company, Sacramento, Cal.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Western States Porcelain Co., San Pablo, Cal.
- Wm. F. Wilson Co., 328 Mason St., San Francisco
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.
- Bashlin Faucets, sold by Brockmann Supply Co., 320 Market street, San Francisco.

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PUMPS
Cbicago Pump Company, 612 Howard street, San Francisco.

RADIATORS
"Presto" Sanitary Radiators (see page 132 for Pacific Coast Agents.)

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dobrmann Co., Geary and Stockton Sts., San Francisco.
Vulcan Iron Works, San Francisco.

REVERSIBLE WINDOWS
Hauser Reversible Window Company, Balboa Bldg., San Francisco.

REVOLVING DOORS
Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROCK BREAKING MACHINERY
Vulcan Iron Works, Francisco and Kearny Sts., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco .
C. F. Weber & Co., 365 Market St., San Francisco.
Kinnear Steel Rolling Doors, W. W. Thurston, agent, Rialto Bldg., San Francisco.
Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
Grant Gravel Co., Flat Iron Bldg., San Francisco.
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
National Roofing Company, Plaza Bldg., Oakland.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

ROOFING TIN
Meurer Bros., A. H. MacDonald, agent, 630 Third St., San Francisco.

SANITARY DRINKING FOUNTAINS
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Haws' Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley.
J. B. Clow & Son., Hearst Bldg., San Francisco.

SASH CORD
Samson Cordage Works, manufacturers of Solid Braided Cords and Cotton Twines. 88 Broad St., Boston, Mass.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Figgs Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.

SCHOOL FURNITURE AND SUPPLIES—Cont'd
A. H. Andrews & Co., 728 Mission St., San Francisco.
Whitaker & Ray-Wiggin Company, 776 Mission St., San Francisco.

SEWAGE EJECTORS
Chicago Pump Co., represented by Telephone Electric Equipment Co., 612 Howard street, San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Capitol Sheet Metal Works, 1927 Market St., San Francisco.
U. S. Metal Products Co., 525 Market St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SLATE ROOFING
Fiberstone & Roofing Co., 971 Howard St., San Francisco.

STEEL AND IRON—STRUCTURAL
Burnett Iron Works, Fresno, Cal.
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Brode Iron Works, 31 Hawthorne St., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Vulcan Iron Works, San Francisco.
Western Iron Works, 141 Beale St., San Francisco.
Woods, Huddart & Gunn, 444 Market St., San Francisco

STEEL PRESERVATIVES
Bay State Steel Protective Coating. (See page 30 for coast agents.)
Wadsworth, Howland & Co., Boston Mass. (See Adv. for Coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.

ARCHITECTS can make no mistake in specifying

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SCHOOL SUPPLIES OF ALL KINDS

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Branch Yards { TRACY, CAL. / MAYFIELD, CAL.

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The American Hardware Corporation, Successor

New Britain, Conn. 833 Market Street, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL BARS FOR CONCRETE
- Kahn and Rib Bars, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Woods, Huddart & Gunn, 444 Market St., San Francisco.
- Pacific Coast Steel Co., Rialto Bldg., San Francisco, and Union Oil Company, Los Angeles.

STEEL MOULDINGS FOR STORE FRONTS
- J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

STEEL FIREPROOF WINDOWS
- United States Metal Products Co., San Francisco and Los Angeles.

STEEL ROLLING DOORS
- Kinnear Steel Rolling Door Co., W. W. Thurston, Rialto Bldg., San Francisco.

STEEL WHEELBARROWS
- Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
- California Granite Co., 518 Sharon Bldg., San Francisco.
- Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
- Colusa Sandstone Co., Potrero Ave. and Division St., San Francisco.
- McGilvray Stone Company, 634 Townsend St., San Francisco

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
- S. F. Bowser & Co., 612 Howard St., San Francisco.

SURETY BONDS
- California Casualty Company, Merchants' Exchange Bldg., San Francisco.
- Globe Indemnity Co., Insurance Exchange Bldg., San Francisco.
- J. B. Nabors & Sons, Kohl Bldg., San Francisco.
- Fidelity & Deposit Co. of Maryland, Mills Bldg., San Francisco.
- Pacific Coast Casualty Co., Merchants' Exchange Bldg., San Francisco.

TEMPERATURE REGULATION
- Johnson Service Company, 149 Fifth St., San Francisco.
- G. E. Witt Company, Inc., 850 Howard St., San Francisco.

THEATER AND OPERA CHAIRS
- A. H. Andrews, 728 Mission St., San Francisco.
- C. F. Weber & Co., 365 Market St., San Francisco.
- Whitaker & Ray-Wiggin Company, 776 Mission St., San Francisco.

TELEPHONE EQUIPMENT
- Telephone Electric Equipment Co., 612 Howard St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
- Mangrum & Otter, 561 Mission St., San Francisco.

TILE FOR ROOFING
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
- Denison Hollow Interlocking Blocks, Forum Building, Sacramento.

VITREOUS CHINAWARE
- Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

VACUUM CLEANERS
- Invincible Vacuum Cleaner, R. W. Foyle, Agent, San Francisco.
- "Tuec" Air Cleaner, manufactured by United Electric Co., 110 Jessie St., San Francisco.

VALVES
- Jenkins Bros., 247 Mission St., San Francisco.

VALVE PACKING
- "Palmetto Twist," sold by H. N. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
- W. P. Fuller Co., all principal Coast cities.
- Glidden Varnish Co., Cleveland, O., represented on the Pacific Coast by Whittier-Coburn Co., San Francisco.
- R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
- Standard Varnish Works, 113 Front St., San Francisco.
- S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
- C. F. Weber & Co., 365 Market St., San Francisco.

WALL PAINT
- San-A-Cote and Vel-Va-Cote, manufactured by the Brininstool Co., Los Angeles; Marion D. Cohn Co., Hansford Bldg., San Francisco, distributor.

WALL BEDS
- Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BOARD
- "Amiwud" Wall Board, manufactured by Paraffine Paint Co., 34 First St., San Francisco.
- Schumacher Wall Board Co., 149 California St., San Francisco.

WATER HEATERS—AUTOMATIC
- Pittsburg Water Heater Co. of California, 237 Powell St., San Francisco, and Thirteenth and Clay Sts., Oakland.
- Hoffman Heater Co., 397 Sutter St., San Francisco.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
- Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
- Concreto Cement Coating, manufactured by the Muralo Co. (See page 5.)
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- Glidden's Concrete Floor Dressing and Liquid Cement Enamel, sold on Pacific Coast by John King & Sons, 36 Stanford St., San Francisco.
- Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.
- Imperial Co., 183 Stevenson St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
- Wadsworth, Howland & Co., Inc. (See Adv. for Coast agencies.)

WHEELBARROWS—STEEL
- Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL FINISH
- "Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
- "Silkenwhite," made by W. P. Fuller & Co., San Francisco.
- "Satinette," Standard Varnish Works, 113 Front St., San Francisco.
- Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Co. (See Adv. for Coast distributors.

WINDOWS—REVERSIBLE, ETC.
- Whitney Adjustable Window Co., San Francisco. (See page 125.)
- Hauser Reversible Window Co., Balboa Bldg., San Francisco.

WINDOW SHADES
- Top Light Shade Co., 737 Market St., Oakland.

WIRE FABRIC
- U. S. Steel Products Co., Rialto Bldg., San Francisco.

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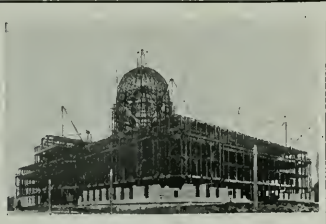

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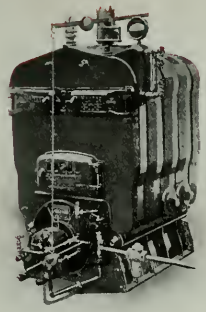

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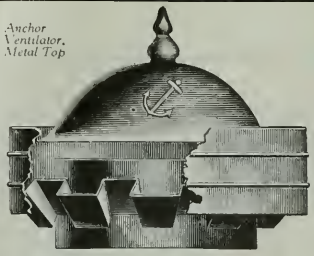
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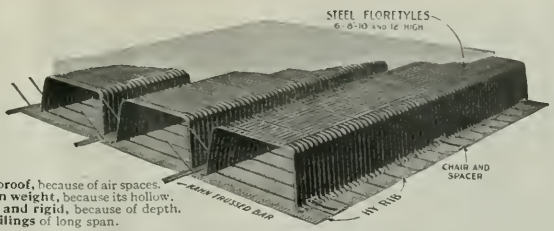

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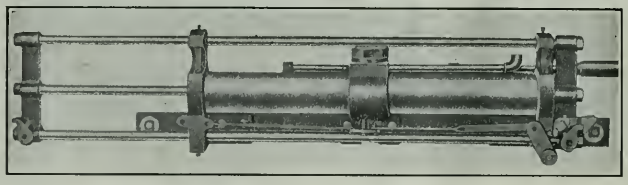

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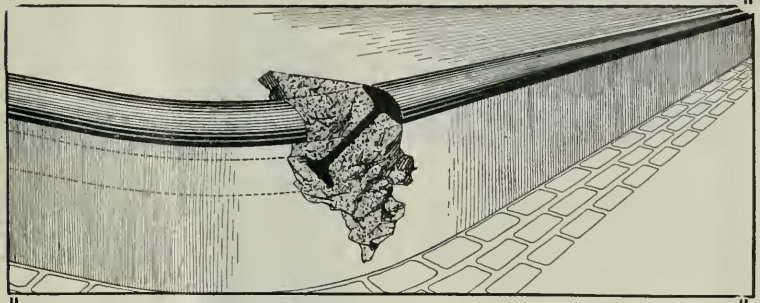

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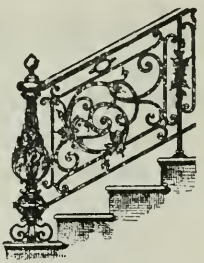

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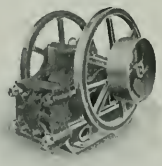

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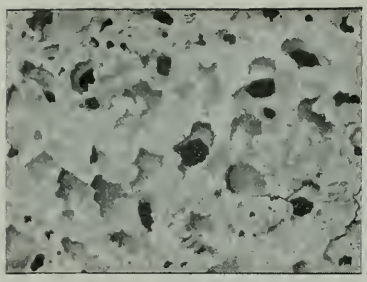

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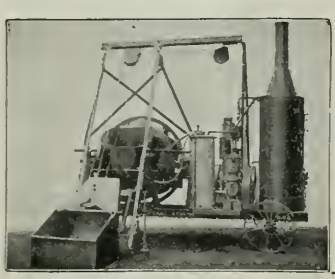

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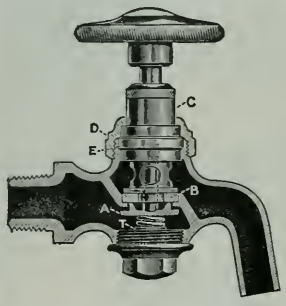

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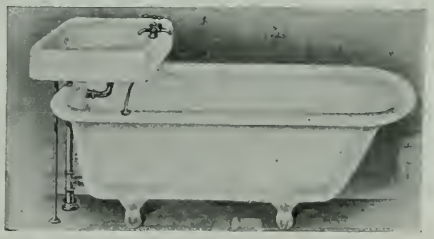

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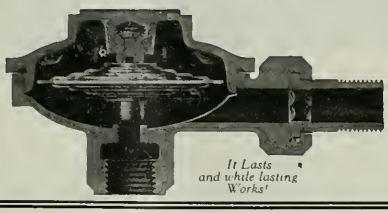

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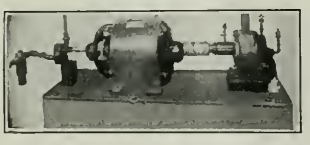

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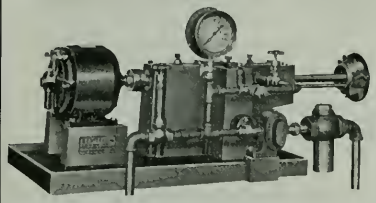

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POSTOFFICE BUILDING, BERKELEY, CALIFORNIA
O. WENDEROTH, SUPERVISING ARCHITECT

Frontispiece
The Architect and Engineer
of California
For October, 1915

THE

Architect and Engineer

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VOL. XLIII OCTOBER, 1915 No. 1.

The Berkeley Post Office — An Example of the New Public Building Policy

By WILLIAM ARTHUR NEWMAN, Architect

AN order recently issued by the Secretary of the Treasury to the Supervising Architect's office puts into effect his policies with reference to the construction of future postoffices and federal buildings.

Since the advent of the present administration architectural publications and periodicals of general circulation have devoted considerable space to discussions for improvement in this work, and the present policy is the outcome of heated debates by extremists on both sides.

Some economists have advocated abandoning the creditable standards which have prevailed for the past fifteen years, seeking to have federal buildings designed like warehouses or factories, obsessed with the practical, and losing sight entirely of the architectural and esthetic values. On the other hand over-zealous partisans have gone to the other extreme, where common sense and sound business judgment would dictate otherwise.

There is a happy medium between these two extremes, and it is apparent the Secretary aims to provide new buildings, not only practical and suitable for the needs of the community in which they are to be placed, but also as beautiful as can be designed with the means available; buildings which will educate and develop the public taste and eventually elevate it to a higher plane.

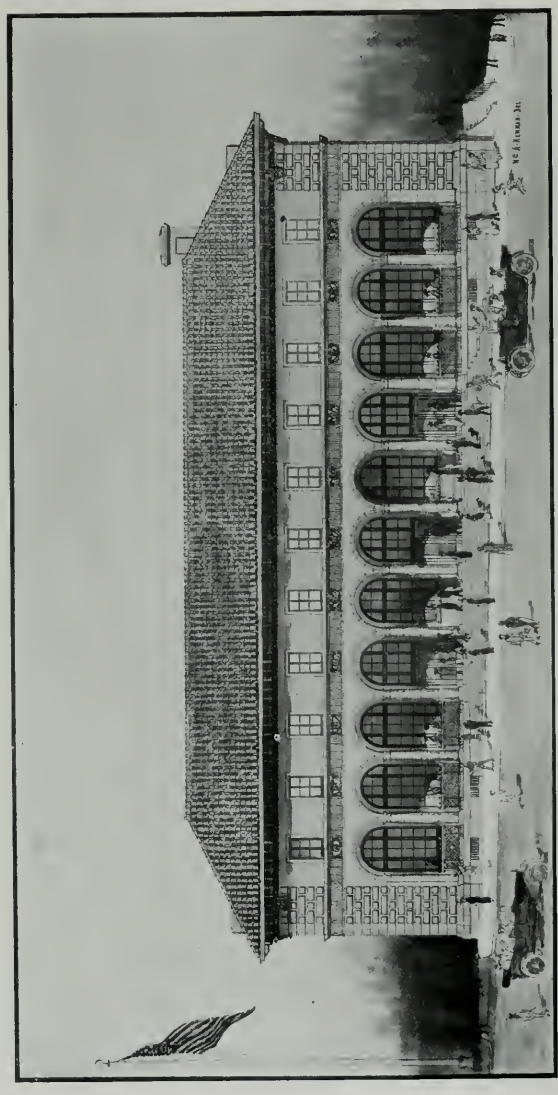
The new order seeks to establish a national system of uniformity and business economy in the construction of Government buildings and to get away from the old "hit and miss" system which has cost the people many millions of dollars.

Under the old system buildings were constructed to fit whatever appropriation Congressmen were able to get for their towns, without regard particularly to whether or not the building was suitable for the locality or the needs of the Government service.

As a result of this system, small villages often got costly and elaborate stone structures where they were not needed, and other localities less fortunate and where increased facilities were greatly required, were given inadequate buildings or none at all.

Under this system Congress authorized by the score postoffice buildings costing from fifty thousand to one hundred and fifty thousand dollars in towns where the total receipts of the postoffice would not pay for the maintenance of the building when erected.

In the design of the new buildings consideration is to be given to what is appropriate to the respective communities, both as to the type of building to be erected and the materials to be used, and this is to be kept in mind, notwithstanding the authorizations may permit of much more elaborate treatment. Effort is to be made to conserve rather than unnecessarily to expend appropriations. This does not mean that savings are to be effected at the expense of



PERSPECTIVE, U. S. POSTOFFICE BUILDING, BERKELEY, CALIFORNIA
O. WENDEROTH, SUPERVISING ARCHITECT

COLONNADE LOOKING EAST
POSTOFFICE BUILDING, BERKELEY

CARRIERS' ENTRANCE AND REAR VIEW, POSTOFFICE BUILDING, BERKELEY

MAIN LOBBY, LOOKING EAST, POSTOFFICE BUILDING, BERKELEY

space and facilities, or that the designs employed are to be stripped of ornamentation. The buildings are to be in keeping in their architectural design and in the materials to be used in their construction with the communities in which they are to be placed.

* * *

The new Berkeley postoffice, now nearing completion, is a good example of the type of building which the recent order will provide; a Renaissance building, fireproof, with steel frame construction and tile roof, containing two stories and basement, costing approximately $130,000.

The site is centrally located at the corner of Allston Way and Milvia street, adjoining the Elk's club and the Shattuck hotel.

Bedford, Indiana, limestone has been used up to the watertable line with granite steps; the walls above are of cement stucco with terra cotta trimmings having a sanded-cream finish, used for the first time on the Pacific coast. Kasota marble columns support the vaulted arches over the main entrance loggia extending across the entire front.

The first floor will be occupied by the postoffice department. On the second floor quarters have been assigned to the Civil Service Commission and Bureau of Animal Industry and other federal officials.

The interior finish in the public lobby is in oak and marble with ornamental bronze and plaster.

The construction of this building comes under the jurisdiction of the office of J. W. Roberts, supervising superintendent. Van-Sant Houghton Co. were the general contractors.

Local materials were used in the construction as far as practicable, but in the new order Secretary McAdoo states: "While I recognize the fact that frequently strong sentiment is expressed in favor of the use of local materials in the construction of public buildings, I do not feel justified in limiting competition to such materials, or in awarding contracts for materials so produced at prices which amount to subsidizing local industries."

The new federal building in Berkeley has received the commendation of local architects and upon completion of some remaining grill work and installation of lighting fixtures the structure will be a source of pride and satisfaction to all.

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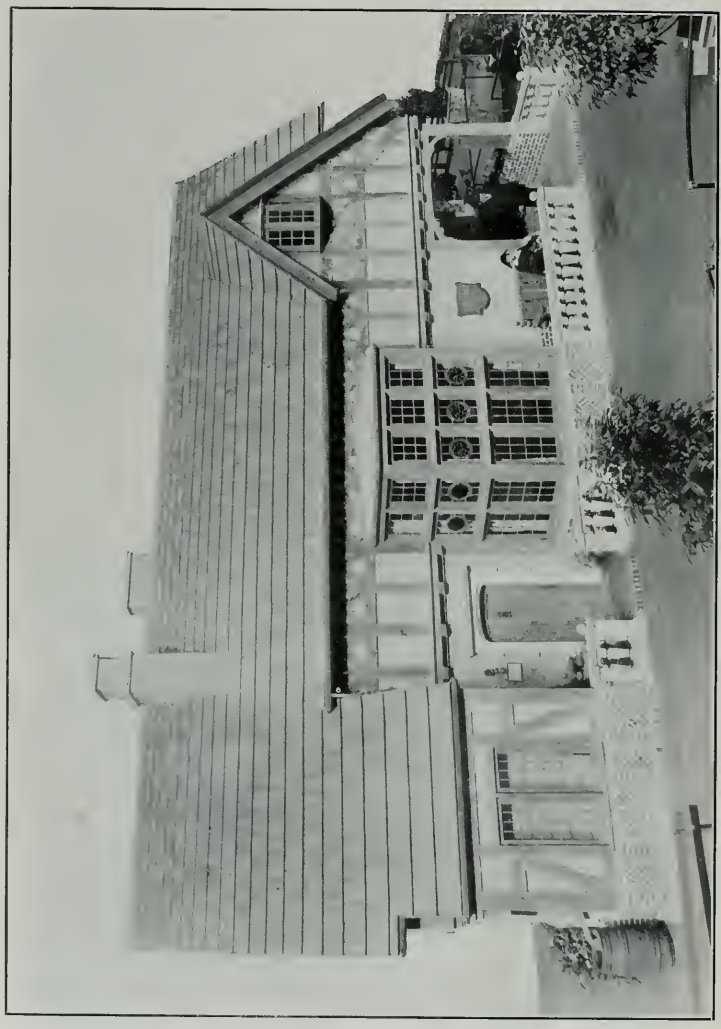

ENGLISH COTTAGE, PANAMA-PACIFIC EXPOSITION
L. B. DUTTON, ARCHITECT

An English Cottage at the Exposition

By HORACE G. SIMPSON*

THE interest shown by Exposition visitors in the English Cottage which forms a part of the exhibit of the Holt Manufacturing Company has seemed to warrant the publication of a brief description of the building and some account of how it came into existence.

The history of the Holt Company of Stockton is so widely known that no comment on that subject is required. Its product is known and in use in nearly every part of the world and when the Exposition was started it was natural that the company should install an exhibit worthy of its prominence. Of course some sort of booth or office became necessary in connection therewith. The company wished to avoid the commonplace effect usual with these structures and to obtain an effect of distinction which should focus interest upon their exhibit. It was thought that a miniature farmhouse would accomplish this and would be particularly appropriate because of the Holt Company's intimate connection with agriculture. The company retained L. B. Dutton & Co., now retired, to take charge of the work, and as chief designer for that company it became the duty of the author to plan the building. At first some attention was given to the idea of making a house in the "Mission style." The essence of this style, however, is tranquility secured by large unbroken wall surfaces and as the location of the building made a large glass area imperative, this style was seen to be inappropriate. This will readily be understood when it is remembered that the cottage is not out of doors and, consequently, receives much less light than if that were the case.

Another consideration was to have a building which should be absolutely different from the neighboring exhibits, which should draw attention amid the "busy" surroundings, by the very qualities of reticence and privacy which usually avoid it. These considerations led to the adoption of the English half timbered type of cottage. It was continually sought to preserve simplicity both of plan and elevation while retaining the vital qualities of charm and picturesqueness without which the building would have failed. By the use of oak timbers, closely simulating the antique methods of framing and fastening and by retaining a very naive, almost crude, character in the carving, it was possible to secure an effect of genuine antiquity which, doubtless, has enhanced the effect.

I would like to correct here the erroneous impression that the building is an exact replica of an existing cottage in England. While historic examples were freely consulted, none was followed exactly, nor would this have been possible had the desire existed.

While this style is pre-eminently fitted to the purposes of country and suburban life, very few good examples have as yet been built in this state; the modern perversions of the Mission style seeming to hold a quite disproportionate place in the popular affection. This caused some doubt as to how the Holt building would be received and it has been very gratifying to hear from many sources expressions of interest and commendation. This gives strength to the belief that this style of building may hope to gain a place in the popular favor which its eminent fitness for the local climate warrants.

*Wood & Simpson, Architects.

ELEVATION, ENGLISH COTTAGE, P. P. I. E.
L. B. DUTTON, ARCHITECT

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INTERIOR, LOOKING TOWARD OFFICE, ENGLISH COTTAGE, P. P. I. E.
L. B. Dutton, Architect

What Is An Architect?

By CHARLES C. RICH*

WHAT and who is an architect? Is the practice of architecture a trade or a profession? If a trade, how does it differ from that of a carpenter or a mason? If a profession, what is there in it which so dignifies it? Just what is an architect's relation to building operations? Are his services of any value, or is he only another middle man who steps in and helps to gobble up the poor owner's funds?

These are questions which long-headed investors have learned (sometimes by bitter experience) to answer; but the fellow who has never "builded" really doesn't know, and to him these questions should be pertinent, for there is perhaps no profession about which there is as much general misunderstanding as that of architecture.

Billy Sunday sometimes says to his converts: "No, you don't have to join a church to get to heaven; you don't have to take a boat to get to Europe—the swimming is good." You certainly don't have to hire an architect to get a building—the swimming is good. Why have a general for an army? Why have a chief for a fire department? Why have a head for any job?

"But," you say, "my builder is my architect; he is the boss; he has been building for 20 years, and he draws plans, too." No, Mr. Investor, he is not an architect. He may say he is, but he is no more an architect than the old-style butcher-mayor is an expert on city government. He may, however, be a butcher—a wood butcher.

In some states the words "architect" and "architecture" are defined by law. The state of Oregon makes no such definition. Consequently those legitimately qualified to practice architecture as architects have no way of offsetting the misuse of the name and the general lack of understanding of the architect and his usefulness. It is the purpose of this discussion to make clearer the function of the architect and his relation to the prospective investors and to the several tradesmen who contribute their services to building operations.

The doctor and the lawyer, both professional men, are not compelled to define their functions in society. Their positions are generally understood through restrictions of law and custom. But architecture, a no less honorable profession, and certainly no newer and no less important, is at a disadvantage in this particular locality where safeguards in the wild scramble for immediate riches are so easily ignored.

The architect is a genuine safeguard; a safeguard against poor planning and poor construction, a safeguard against poor ventilation, a safeguard against ugliness in form and color. He is an expert, trained by years of study in school and travel and practice; an expert builder, plus an artist in design and planning. He may never have lifted a saw or a hammer, and yet he is a craftsman in the largest and truest sense; indeed the chief craftsman.

Everyone is familiar with the organization of men on a building job up to the point of the contractor or the general contractor. The first unit is the laborer; above the squad of laborers is the straw boss, who is able to correlate the work of his little group.

Above the several straw bosses is the foreman; and above the foremen of the several trades—the excavators, the bricklayers, the plumbers, the painters, the plasterers, and all the rest—is the superintendent, or the general contractor. Upon the shoulders of this estimable gentleman rests all the risk and hazard for the profits for the entire aggregation. He has

*Architect, Corbett building, Portland, Oregon.

advanced money and bonded himself, and he, therefore, becomes a very much interested and prejudiced party in the contract.

Every action and process affects his pocketbook. His interests, to a large degree, are directly opposed to those of the owner. The owner is thrown on the offensive and he is on the defensive, or vice versa.

If there are several contractors, the owner is at the mercy of several men, each with conflicting interests. The owner may think that he is shrewd enough to command from these men a certain quality of material or workmanship, but he cannot meet them on an equal footing, for he is dealing with men, all of whom know more than he does about building customs and standards. No adequate plans or specifications can have been prepared, and in case of dispute he has no recourse but the courts, and even at court he is at an evident disadvantage.

All this, I am sure, is granted. Now, let us suppose a parallel case. A man (the owner) becomes ill. He knows that hospitals are for sick people. He goes to the manager of a hospital (the contractor) and contracts to have his body (the building) restored or rebuilt. The hospital man deals with his case to the best of his knowledge—but the sick man has not gone at the task of getting well in the right way.

He has left the advisor and expert out of his arrangement. He may get well, but he should have had a physician as a safeguard. Leaving the expert advice of an architect out of consideration in a building undertaking shows as poor economy as leaving out the expert advice of a physician in case of illness.

* * *

Longfellow's Home, a Fine Example of Colonial Architecture

Longfellow's home, Craigie House, in Cambridge, is to be preserved for the public. Several months ago, says the Boston "Transcript," it is learned from the filing of the will of Mrs. Richard Henry Dana (Edith Longfellow Dana), daughter of the poet, the surviving heirs agreed to entrust the house to three trustees, together with a sum of money for upkeep, for a triple purpose: (1) "As a specimen of the best Colonial architecture of the eighteenth century"; (2) "As a historical monument of the occupation of the house by George Washington during the siege of Boston in the Revolutionary War"; (3) "As a memorial to Henry Wadsworth Longfellow."

Longfellow heirs may live in the house by paying rent. When the time comes that no surviving heir wishes to do that the mansion is to be managed solely as a memorial "for the benefit of the public." Thus, definitely and without further action, Craigie House is placed forever among the state's public monuments to art and patriotism, and to celebrate equally one who pleaded for justice, humanity, and, particularly, the beautiful.

* * *

What City Planning Can Do

To show what city planning commissions can do, the California Conference on City Planning has prepared a bulletin under the above title. The bulletin states briefly the reasons or need for city planning, what city planning commissions can do—how collect their data, maps and preliminary information, how prepare a city plan—and also contains a copy of the new law for the creation of planning commissions, a model ordinance for the establishment of the commission, a list of the city planning commissions in the United States and also a list of recommended books, reports and periodicals on city planning. Copies may be had by sending fifty cents to the Secretary of the Conference, 1120 Crocker building, San Francisco.

FRONT ELEVATION OF PRESENT STRUCTURE, MUNICIPAL PARK, FULLERTON, CAL.

Unique Design for a Municipal Park

By WILBUR DAVID COOK, JR., Landscape Architect*

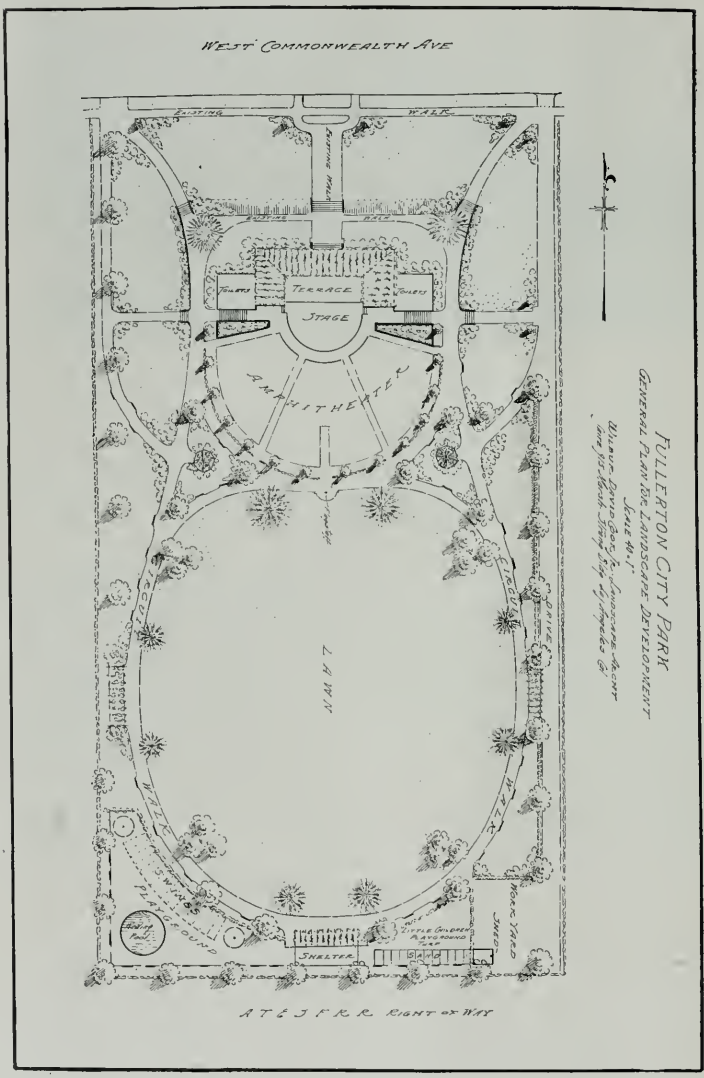
THE writer was called in a short time ago by the city of Fullerton, California, to prepare plans for its city park. The site is unique in many ways.

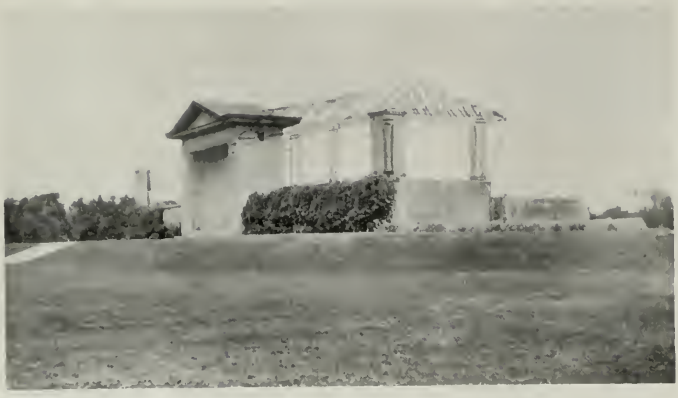
It was formerly occupied by the Fullerton high school and comprised about four acres of nearly level ground. The building was destroyed by fire, leaving only a front terrace of cement, the entrance arch, the foundations and cellar. It was a question whether to remove what was left or to try and incorporate it into a park scheme.

At my suggestion the structure was retained, and a pergola will be built over the terrace, and the cellar will be made into an amphitheatre which will seat 1500 people. This feature really determined whether the park should be treated in a formal or informal manner. It naturally called for a formality of treatment and the park has been developed along these lines. The problem was further complicated by some existing cement walks which the park board wanted to keep. These were retained and a circuit walk was planned about a large central lawn. This left two areas at the south end of the park, one of which was reserved for a work yard, tool shed, etc., together with a small playground of turf for little children from three to five years of age. Sand boxes, swing-teeter boards and seats were provided and this little area will accommodate about 80 children.

The other area was reserved for older children, and a wading pool was provided, together with cups, swings, parallel bars, merry-go-rounds, tether ball, poles, etc.—this area accommodating 180 children. Both playgrounds will be concealed from the rest of the park by woven wire fences covered with roses. Between the two playgrounds a shelter is shown containing rest rooms and toilet accommodations for mothers with young children. This shelter will be rustic in character to conform to the arbor in front of it.

*Mr. Cook has been appointed one of a committee of three to serve on a special committee, representing the Am. Soc. of Landscape Architects at the P. P. I. Exposition. Messrs. Dawson and Childs are the other two members.


WEST COMMONWEALTH AVE
EXISTING WALK
EXISTING WALK
EXISTING WALK
TOILETS
TERRACE
TOILETS
STAGE
AMPHITHEATER
LAWN
DRIVE
WALK
WALK
SWINGS
PLAYGROUND
SHELTER
SAND
WORK YARD
SHED
A T & S F R R RIGHT OF WAY
FULLERTON CITY PARK
GENERAL PLAN FOR LANDSCAPE DEVELOPMENT
SCALE 40 = 1"



VIEW OF PRESENT STRUCTURE FROM NORTHWEST, FULLERTON CITY PARK
Pencil lines indicate roof to proposed amphitheatre

Two more rustic pergolas, provided with seats and covered with vines, will afford shady resting places overlooking the large central lawn.

Two small rustic shelters are also shown near the amphitheatre. A stage, dressing rooms and toilet accommodations are also provided for in the main structure. The amphitheatre will be enclosed by a semi-circular rose-arbored lattice, backed with Italian Cypress for formality of effect. Very little work will be required to put this park into splendid shape. Fortunately, Fullerton has a board that is progressive and they are all enthusiastic about their park. It was a pleasure to work with them. The plans have been approved and work will be started at once.

ANOTHER VIEW OF AMPHITHEATRE
Wilbur David Cook, Landscape Architect

RESIDENCE FOR MRS. ALANSON WEEKS
SMITH O'BRIEN – ARCHITECT
HUMBOLDT BANK BLDG
JUNE 1913.

An Office Building for Dentists

By C. W. DICKEY, Architect*

IT is with great pleasure and satisfaction that I have accepted your invitation to present this paper on the subject of "An Office Building for Dentists." As an architect, I appreciate the need for better co-operation between your profession and mine in order to better serve your needs and thereby better serve the interests of our clients.

It is my business to design buildings that will pay dividends. Such buildings must be kept full, which means the occupants must be kept satisfied.

Dentists as a class are the most expensive tenants we have to provide for, but I shall attempt to prove that they can be made profitable to the owner. They form a very large percentage of the office building tenants in any city, particularly in the smaller cities and cannot be overlooked. Both dentists and physicians are unpopular with owners in general. The reasons for this lack of popularity were well expressed by William F. Bensing in the September, 1914, number of Building Management, as follows:

"(1) That the initial expense of equipping offices for this class of tenants is larger than for the average commercial tenant.

(2) That in buildings where electricity is furnished gratis, the cost of supplying physicians and dentists with this commodity is very much increased on account of electrical equipment in their offices.

(3) That this class of tenants are very hard to please; that they are very temperamental and do not have any idea of business.

(4) That the cost of janitor service is increased about one-third by the occupancy of dentists and physicians.

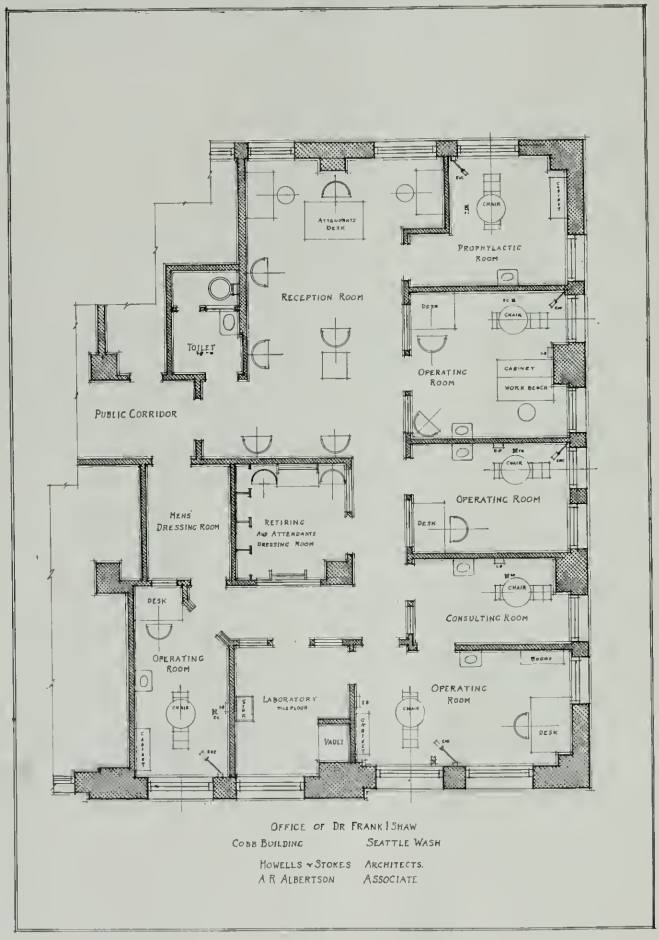
(5) That elevator traffic is considerably heavier by reason of their tenancy in a building.

(6) That unless a building is strictly specialized for dentists and physicians, the fact that they occupy space in the structure is detrimental to renting of the balance of the space."

In spite of all these more or less real objections, this class of tenants must be accommodated and the object of this paper is to discuss how best this can be done to the satisfaction of both owner and tenant.

Office space is generally rented at a certain price per square foot. Often a dentist has to pay for much space that he does not require, because the plan of the building does not readily lend itself to subdivision for his needs. This is a disadvantage both to the tenant and the owner; the former has too much space to carpet and furnish, the latter has too much space to heat and light and keep clean. A properly and compactly planned office with ample room but no waste space gives much more the impression of efficiency than an awkward, ill-arranged and overgrown office. In this fact lies the solution of the problem. A properly planned building which lends itself readily to compact dental suites can demand a higher rental per square foot and yet the lump sum rental to the tenant will be less than in other buildings. The dentist requires certain things and is willing to pay a certain monthly rental to secure what he requires. It makes very little difference what the price is per square foot if he gets what he wants for a certain lump sum. This theory works out in practice. The specialized buildings catering to dentists and doctors get a higher rental than their

*Paper read before the Panama-Pacific Dental Congress, San Francisco, California, and revised by the author for this magazine.



AN IDEAL PLAN FOR DENTAL OFFICES

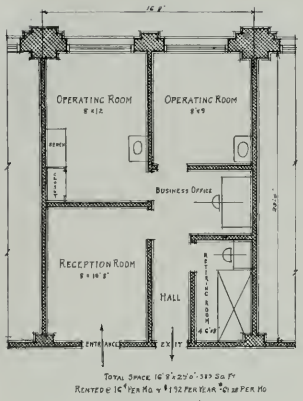
neighbors and yet are always well filled. This is especially true of such buildings as the Michigan Boulevard building, the Reliance building, and the Marshall Field Annex building of Chicago; the Cobb building of Seattle, and the Elkan Gunst building of San Francisco.

The question now arises as to wherein the ordinary office building fails to meet the requirements of the dental profession. In the first place, the windows are not spaced so as to permit a series of small rooms with windows at or near the center of each; in the second place the public corridor is ordinarily placed too close to the outside wall to permit of an economical use of the space. These conditions cannot be overcome after a building is erected. The utilities such as electricity, gas, compressed air, supply and waste for fountain cuspidors, etc., are usually inadequate or badly placed, but this of course can be overcome at considerable trouble and expense.

We now come to the crux of the whole matter: what should be the plan and equipment of an ideal building for dentists? Are their wants sufficiently standardized to permit an architect to satisfy all the members of the profession? These are the questions I have been diligently studying for some months past with the kind assistance of a number of dentists, dental supply houses and architects. Although opinions differ on many important matters, all seem to agree that the essential requirements for the average dentist consist of a waiting room, two or more operating rooms, a laboratory, a ladies' retiring room, a small store room or cabinet, a business office or a suitable space for a desk where the dentist can talk business privately with the patient, a private exit to the public corridor and a vestibule or hall connecting all these rooms so the office girl can see the patients after they are through in the operating rooms or dressing room. Some dentists require considerably more than this and others require less but this seems to be a good average. I shall take up these various items in their order.

The waiting room need not be large as most patients come by appointment and no patient is required to stay long in the waiting room. This room should be well ventilated and well lighted either by natural light or artificially as this permits the most economical arrangement of the office suite. Those demanding natural light for the waiting room will have to secure it at the sacrifice of valuable space. A small waiting room furnished in good taste is more inviting than a large room, and a warm light from attractive electric fixtures of the semi-indirect type is more attractive than the natural light on a dark day. If electric lights are turned on in a room having an outside window, the effect is not as inviting as in the room with no outside light. Ventilation can be obtained by the use of transoms and fans.

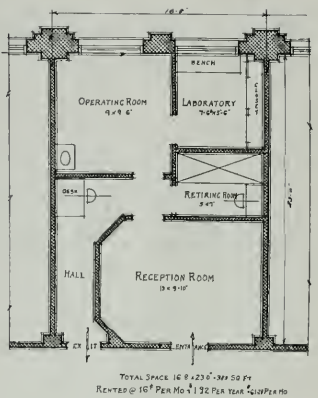
Operating rooms should open upon a vestibule, should have a window at or near the center of one side and should be large enough to receive the operating chair, cabinet, basin, etc., and leave sufficient room for the operator and his assistant. This requires a room about eight feet wide and nine or ten feet deep. If a laboratory bench is to be placed in the room, it should be ten feet wide or twelve feet deep. The window should be placed so as to leave at least eighteen inches for a switchboard on one side and an engine on the other and should extend as close as possible to the ceiling. The basin should have pedal on knee supply valves. Many dentists are placing the switchboard back of the cabinet supported on an angle frame and set at an angle of 45 degrees with the wall and are removing all apparatus from in front of the patient by using an operating table



TOTAL SPACE 16'-8"x23'-0"=383 SQ. FT.
RENTED @ 16¢ PER MO. = $1.92 PER YEAR = $61.28 PER MO.

PLAN NO. 1

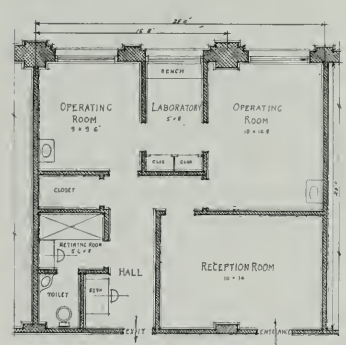
Getting the most of a space 16'-8"x23'-0" with two windows. Note the two operating rooms and the laboratory bench instead of laboratory room. Rentol at 16 cents—$61.28 per month. The following plans are all in a building with windows averaging 8'-4" center to center, and with a distance of 23'-0" from corridor to outer wall.



TOTAL SPACE 16'-8"x23'-0"=383 SQ. FT.
RENTED @ 16¢ PER MO. = $1.92 PER YEAR = $61.28 PER MO.

PLAN NO 2

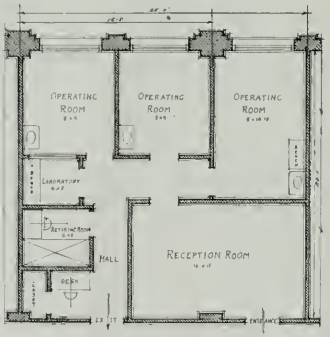
Same space as plan Number 1 but with only one operating room and with a laboratory room. Note the large reception room and operating room. Rental at 16 cents—$61.28 per month.



TOTAL SPACE 23'x23'=529 SQ. FT.
RENTED @ 16¢ PER MO. = $1.92 PER YEAR = $92.00 PER MO.

PLAN NO 3

Office suite occupying three windows. Two operating rooms and a laboratory with outside window. Note the large rooms. Rental at 16cents—$92.00 per month.



TOTAL SPACE 23'x23'=529 SQ. FT.
RENTED @ 16¢ PER MO. = $1.92 PER YEAR = $92.00 PER MO.

PLAN NO 4

Same space as plan number 3 but with three operating rooms and an inside laboratory. Note the smaller operating rooms. Rental at 16 cents—$92.00 per month.

which supports the engine, etc., and is placed back of the chair, and a little to one side. I shall not attempt to discuss the merits of this scheme but as it has not yet been generally adopted, it is still necessary that provision should be made in the building for placing these utilities at the right and left of the window. If desirable for architectural effect, a mullion window or pair of windows may be used in place of a single window. The mullion or pier if not over two feet wide will cast no shadow. In case of a pier between the windows, the switchboard can well be located on its face.

It is highly desirable that the patient should be able to enter the chair without interfering with the operator or his instruments. This means that there must be space to get around the chair and cuspidor on the side opposite the cabinet. Allowing eighteen inches for the cabinet, eighteen inches for the operator, thirty-six inches for the chair and fountain cuspidor and twenty-four inches for a passage for the patient, we have a width of eight feet which should be adopted as the minimum width for operating rooms. This means that the windows, allowing for partitions, should be placed eight feet four inches center to center in order to obtain the greatest economy of space for dental offices. This spacing would not be economical for a commercial office building as it would mean the alternative of sixteen foot offices, which are too wide or eight foot offices which are too narrow.

The laboratory can be placed between two operating rooms with its own outside window and as this room need not be more than four or five feet wide the extra space can be thrown into one or both adjoining rooms. Or the laboratory can be placed back of an operating room, receiving its light through a glass partition.

The ladies' retiring room need not be more than five feet by six feet, six inches, as the only furniture it need contain is a dressing table, a chair and a couch. This room can be placed at any convenient point opening onto the private hall. A lavatory and toilet are useful adjuncts to this room if there is sufficient space.

A small store room is useful but can be dispensed with if a good sized cabinet is provided with space for coats and hats and a separate space for storage.

The business office, whether a part of an operating room, a hall alcove, or an independent room, should be so placed that each patient must pass the desk before leaving the office. It is preferable to have a small separate office for privacy in discussing business with patients.

The general exit can be direct from the private hall or through the business office, but should not be through the retiring room.

In examining the plans of a great many office suites I find that the most economical schemes require from twenty-two feet to twenty-six feet depth from corridor to outer wall. In the Marshall Field Annex in Chicago and the Cobb building in Seattle, this width is twenty-six feet. I find that a width of twenty-three feet from corridor to street front works out well. If we assume these dimensions and a window spacing of eight feet center to center, with windows four feet to five feet wide so as to leave the necessary space for apparatus, our problem is half solved. The column spacing or "bays" can be sixteen feet, eight inches with two windows to a bay or twenty-five feet, four inches with three windows to a bay. These dimensions of course being modified to fit the size of the lot. I have prepared a number of plans of various sized office suites in a building with these dimensions from which you will observe that the space subdivides very advantageously in most cases.

In the early part of this paper, dentists and doctors were mentioned jointly. This was done purposely as it has been found advisable to have both professions in one building. The dentists need a north or east light while the doctors can use a south or west exposure. This is an important point as most buildings have offices with both exposures. In some cases it is found advantageous for a dentist and a doctor to share one reception room. It is also a good thing to have both professions in the building as the patients of the one often need the services of the other.

Having arrived at the proper width of bays and depths of offices, it is a simple matter for the experienced architect to plan the building with adequate elevator service, stairways, corridors, etc. Two public toilet rooms, one for each sex, should be placed on every floor. The utilities, such as electricity, compressed air, gas, water and waste pipes, should be brought up next to the columns in the outer walls. The office floor should be of wood laid on sleepers embedded in concrete. This permits each tenant to use the kind of floor he prefers, be it hardwood, carpet or tile. In case the latter floor is decided upon, the wood floor and sleepers are removed and tile substituted. The space occupied by the sleepers and the concrete sleeper-fill can be used for running plumbing pipes and electric conduits to fixtures located where each tenant may elect. Having thus planned and equipped the office space, it should be left without partitions until rented so as to be subdivided to suit the tenants. The work done this way costs more but it pays in satisfied tenants.

The woodwork should be plain and sanitary with no mouldings to catch dust and should be given a hard, sanitary finish. In operating rooms, the space for about eighteen inches each side of the window should be of plain wood backed up with plank to receive switchboard, engine, etc. Ventilators should be placed in the bottom of these windows so the lower sash can be raised without causing a draught on the patient. All plastering should have a smooth finish.

The corridors should be wide and of sanitary appearance with floor and wall of marble, tile or white glass. These corridors should be given a warm, genial light by a system of indirect lighting. This avoids glass in the walls which spoils the appearance of the reception rooms and gives too commercial an aspect to the building.

The elevators should be ample in number and size and one at least, should be large enough to receive a stretcher and attendants. The speed should not exceed 350 feet per minute as a large proportion of the passengers will be women and children. The elevator car should be given somewhat of a domestic character by the use of hardwood panelling finished natural or enameled with a judicious use of gold. Here, too, a warm, cheerful light should be obtained by indirect lighting from a painted or gilded ceiling.

The entrance lobby should be treated a little different from the lobby of an ordinary office building so as not to look too commercial. A judicious use of ornamental trees in boxes would be effective.

The tenants of the basement, first and second floors should as far as possible, be of those professions or businesses that respond to the needs of dentists, physicians and surgeons, such as pharmacies, dental and medical supply stations, hydrotherapeutic baths, dental and medical laboratories, X-ray establishments, etc.

I shall not attempt to discuss the best varieties of wood for finishing the various rooms, nor the kind of electric lighting fixtures, etc. These matters, like the furnishings, are subject to the personal taste and caprice of each dentist, but I would venture to suggest that most dentists would do

well to leave these matters to the judgment of an experienced architect. The office should be built with a definite plan from the layout of the rooms to the smallest detail of hanging a picture. Only in this way can perfect harmony, which impresses the class of people whom the dentist desires for patients, be obtained. The effect sought should be one of simple refinement; the office should look business-like, but not too commercial; and the operating rooms, although sanitary in appearance should hold no suggestion of a hospital. A properly planned, decorated, lighted and furnished suite of rooms will help to put the patient in a calm state of mind and will greatly aid the efficiency of the dentist.

In conclusion, let me say that the experience of managers of specialized buildings of the kind discussed in this paper has proved that they are most satisfactory. The specialized building facilitates renting after headway has been gained, gives a greater ability to retain tenants, promotes good relations between one tenant and another as their interests are largely in common, and offers inducements for tenants to enter into leases and to renew leases. With these advantages before them, and with the success of other owners for encouragement, it should not be hard to induce owners to erect specialized buildings for dentists and doctors wherever there is a real demand for such buildings.

* * *

Biggest Shade Tree Is Also Best

THAT the largest shade tree in the United States, as brought to light by the prize contest held by the American Genetic Association, should turn out to be the Eastern sycamore is not surprising, say Government foresters. The sycamore has long been regarded as the largest deciduous tree in North America and its range of growth is hardly second to that of any other broadleaf tree; for it can be found from Maine to Florida, and as far west as Kansas.

The bestowal of the prize on a sycamore at Worthington, Indiana, which is 42 feet 3 inches in circumference and 150 feet tall, draws attention to the fact that foresters are nowadays recommending the species especially for city planting. They say that long experience with sycamores planted in city streets has shown that the species is peculiarly able to withstand the smoke, dust and gases which are usually an unavoidable complement of urban life. In addition, the sycamore is as resistant to attacks of insects and fungi as almost any species, and is a quick grower; at ten years of age, a healthy sycamore usually is already large enough for shade as well as for decorative purposes. As for the latter, there is hardly any Eastern species which is generally held so picturesque as the sycamore. With its strikingly mottled bark and magnificent stature and conformation, the sycamore has a marked individuality and can not be mistaken for any other species, either in the summer when the foliage conceals its structural form, or in the winter when the leaves are absent.

A common objection to the sycamore as a lawn tree is its habit of dropping its leaves before autumn. From this characteristic it is sometimes called a "dirty tree." Recently the Forest Service received a letter from a suburban resident who has a sycamore on his lawn. "My sycamore tree is very beautiful," said the writer, "until about the first of August, when its leaves begin to fall. Is there any remedy that I can apply to the tree to keep it from dropping its leaves so soon?" It was necessary to tell the correspondent that this was a characteristic habit of the tree. This drawback, however, is practically the only failing that the sycamore has, and it is offset by many desirable qualities.

Plea for a General System of Architectural Education in our Schools

By RALPH WYCKOFF

IT would be difficult to imagine the sensations of a person of general education, living in this civilized day and age, if he should be suddenly carried back to the dark ages of human history. Then the mind of the average man was filled with superstitions and distrust of those who proposed to do things out of the ordinary. Yet, as nearly every architect knows who has tried to feel the architectural pulse of the general public, we are now in an age of architectural darkness. This does not mean that there is not a great deal of good architecture being produced at this time nor that we are without a considerable number of people well educated in matters architectural. There can be no doubt, however, that the general public is as likely to overlook a really good piece of architecture without notice or comment as it is apt to rave over some abortion that has been produced by accident or that some architect, in sheer desperation, has effected in order to try to start something.

The two questions that arise in the thinking architect's mind are "What has produced this condition?" and "How can it be overcome?" It might be well in the first place, to prove or try to prove that these conditions really exist. In order to prove that bad architecture exists and is now being produced, it will be necessary to establish some standard to judge by. A bad piece of work must be compared with a good specimen. The things which are good are those things, whether buildings, paintings, sculpture, music or literature, that the experts have declared to be good and have stood the test of ages and are still declared to be good. Conversely the things which are bad are those which are unlike the things which are declared to be good. The production of art, music, literature or architecture cannot be reduced to rules of thumb, but there are certain underlying principles in each which have not changed and never will. It is therefore safe to take the things that the experts have declared to be good as a suitable standard to be followed. If we do this it will be seen that there is much that is really very bad and it would not be an exaggeration to say a few that are little short of frightful.

What has produced this condition? Ignorance on the part of the general public in regard to architecture and the weakness of some architects in allowing the public to dictate to them what and how they shall design, through fear of losing their jobs or in not being sure that they will please their clients with the results they produce. It is not the intention of this article to include in this criticism the good results that have been obtained either in public buildings or in private practice but it is the desire to find a remedy for the great mass of bad work that is being done. Neither is it the intention to consider the work produced by incompetent architects. They will, sooner or later, eliminate themselves by reason of their own incompetence.

How can it be overcome? By a general system of architectural education in the public schools. By this is not meant that several hours a week for a number of years should be devoted to the technique of drawing or rendering. This would be harmful to many, impossible for many more and entirely unnecessary for nearly all. By a general system is meant—say—one short lecture a week in the public schools, or perhaps one a month. These lectures should be started in the low grades and continued throughout the whole school course. They may be in the form of diver-

sions and should be illustrated by stereoptican or moving pictures. Good examples of architecture may be shown in comparison to bad ones so that the student may learn what is good and what is bad. The important factor, however, should be the lecturer. But his appointment should not be left to the average school board, if one may judge by some of the selections that have been made by them of designs submitted for proposed school buildings. This selection should be left to a board of known and recognized architects. If other architects feel as does the writer on this subject—and a number have so expressed themselves—it is possible that it would be an easy matter to name an advisory board which would serve without compensation.

We teach music in the schools but we are not compelled to listen to it. We teach cooking but the general public is not compelled to eat the things that are cooked. We do not teach architecture, but it is absolutely impossible to avoid seeing examples of both good and bad architecture if we expect to live in a community. We go down the street and we cannot avoid looking at Mrs. Nuely Gotrox's Louis XVI Byzantine garage or Mr. Montmorency de Sanscerville's new half timber Mission style chateau with its Marie Antoinette porte-cochere any more than we would care to avoid looking at a mansion designed by McKim, Mead & White or a country place by Charles Platt.

This system of education may appear a slow means of attaining the desired end and it is true that it would take many years to get results. However, a beginning must be made and the sooner it is done the better. If any one will suggest a better or a quicker method the writer will be glad to help push it along. That something should be done is recognized by all, especially after one has been trying to convince a client that it is not exactly the right thing or that it is not very architectural to put a Pazzi Chapel rotunda on a brick veneer side-board with a Greek Doric entasis or to put a French Gothic entrance on a Colonial Manor House.

Does any one suppose that the general public in 1906 would have stood it for one moment to have been buncoed out of the Burnham plan when it had the chance to make San Francisco one of the best planned cities in the world, if there had been a public sentiment created by several years of educational system as proposed above? What was the public sentiment in regard to the Burnham plans? Something like this:

"Aren't those pretty sketches, but what do they all mean?"

And Mr. Got Property Titewad answered:

"It means a whole lot of expense and more taxes."

Everyone knows today that Mr. G. P. T. had his way.

* * *

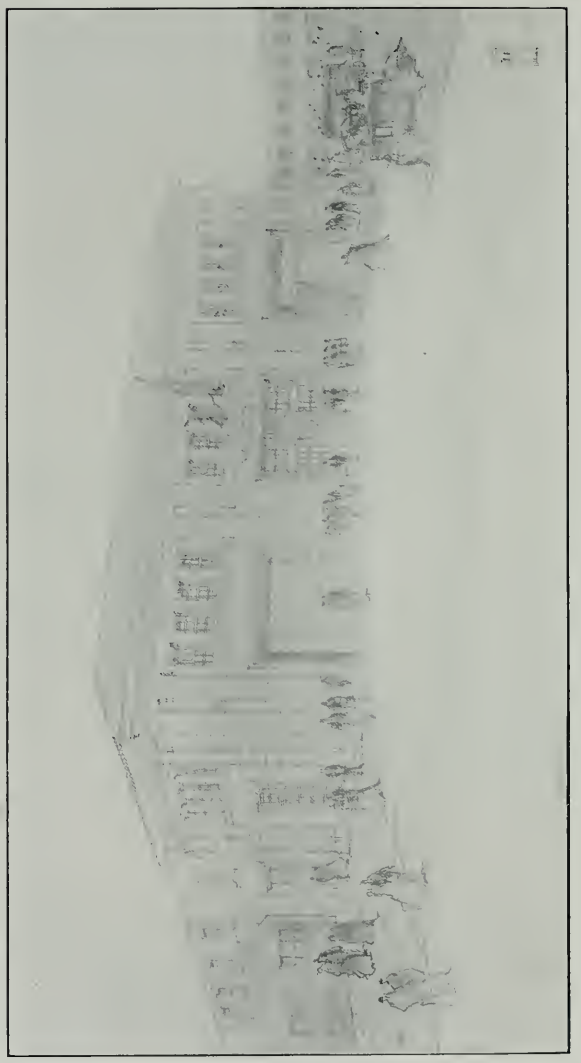
Initiative

It has been my experience that there are but three kinds of men in the world—first the kind you have to tell once to do a thing, and you can bet your life it will be done. The second is the kind you have to tell three or four times—and the third is that great business producing, creative lot of men, who don't have to be told at all. They have initiative.

—HUGH CHALMERS.

* * *

He has achieved success who has worked well, laughed often, and loved much.—Elbert Hubbard.



BUILDING FOR THE WELLS FARGO EXPRESS COMPANY, SAN FRANCISCO HARBOR FRONT
ARCHITECTURAL DIVISION, STATE DEPARTMENT OF ENGINEERING

PIER 26, SAN FRANCISCO HARBOR FRONT, SHOWING A MODIFIED MISSION STYLE

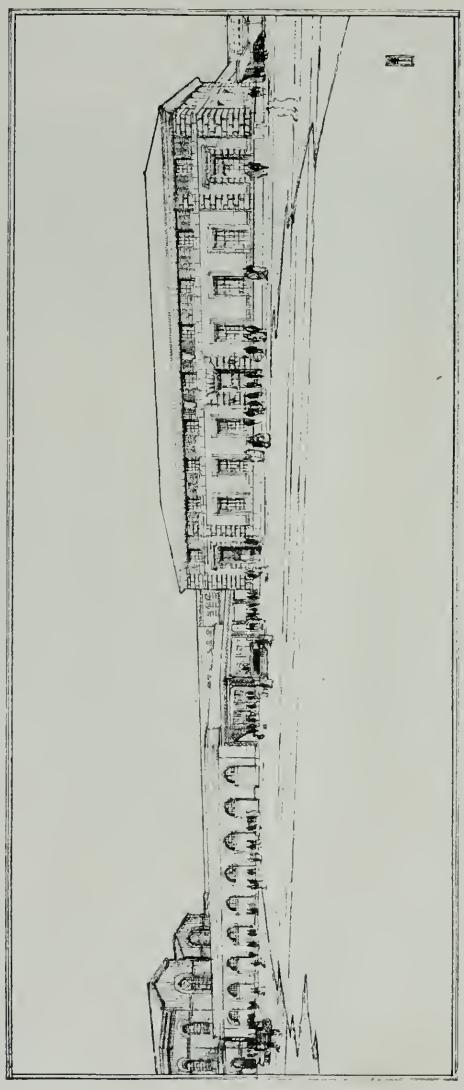
Recent Work of the California State Engineering Department

THE accompanying plates give the reader some idea of the class of work, architecturally and structurally, being carried on by the engineering department of the State of California. Most of the work shown has been completed in the past two years under the direction of Mr. W. S. McClure and his associates. Some wonderful changes have been effected along the San Francisco water front, and the dilapidated, unsightly buildings which once distorted the bay and street frontages are, happily, gradually giving way to substantial structures, carrying more than a mere suggestion of architectural beauty. In the interior of the state the same aggressive policy has been followed in an effort to produce something that the tax payer may feel proud of. The Department of Architecture, in charge of Mr. George B. McDougall, has worked wonders with the limited appropriations available and it can be said without exaggeration that California has made greater progress in developing a high standard of architecture for its public buildings than any other state in America, and that is saying a great deal when one takes into consideration the general tendency of many of the eastern states to build better public edifices.

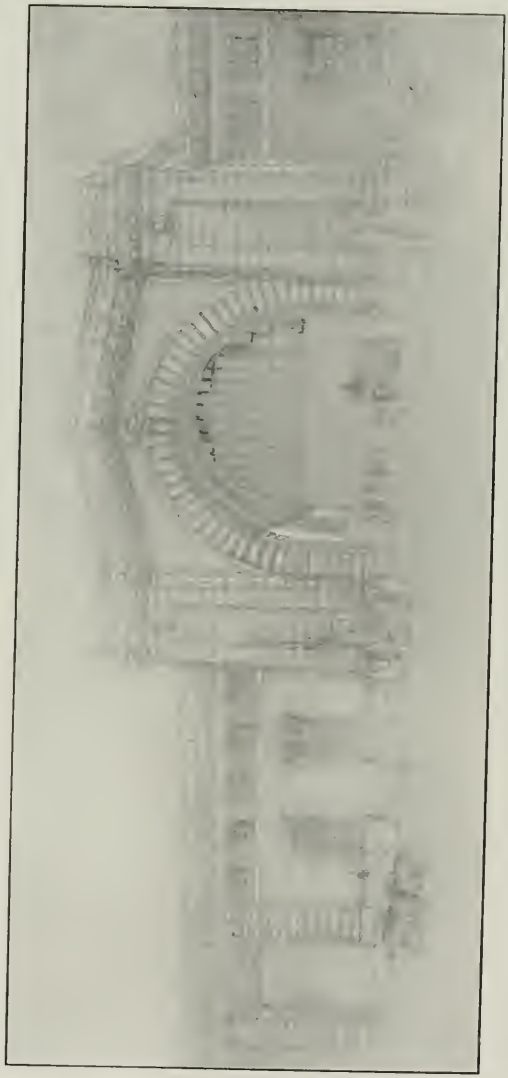
In connection with the California state improvements, the following abstract from Mr. McDougall's report of the work of the Architectural Division, from November 1, 1912, to October 31, 1914, will be found interesting:

The Architectural Division of the Department of Engineering does all architectural work, structural engineering and mechanical engineering, which latter includes power plant, heating, ventilating and electrical engineering, as required in connection with all new construction and all repair work at thirty-two different state institutions, which have a combined population in students, patients and prisoners of about twenty thousand.

There were authorized in 1913 eighty-five appropriations aggregating $3,058,405 for building construction at these various institutions, and, in addition to this, estimates from the several boards of management have been approved during the past two years for fifty-one different pieces of con-



POSTOFFICE BUILDING, SAN FRANCISCO HARBOR FRONT
Designed by Architectural Division, State Department of Engineering



NEW PIER ENTRANCE, SAN FRANCISCO HARBOR FRONT
Designed by Architectural Division, State Department of Engineering

PIER 28, SAN FRANCISCO HARBOR FRONT

struction, aggregating in cost $163,973.81; this added to the amount of the appropriations makes a total of $3,222,378.81 for one hundred and thirty-six different pieces of work.

The schedule of proper minimum charges of the American Institute of Architects, which schedule today governs the practice of all our best architects, makes 6 per cent of the total cost the architect's minimum compensation in any case, and where the work is of small cost, and in connection with the remodeling of existing buildings, 10 per cent and sometimes 15 per cent of the cost is paid; the institute's schedule also provides that the owner, in addition to this percentage payment, shall defray the expense (amounting to about 1 per cent of the total cost) involved in securing special expert service covering structural engineering and mechanical engineering, which latter includes power plant, heating, ventilating and electrical engineering (all of which items are included in the 4.50 per cent above mentioned), also the expense involved in the continuous service at the building site itself, of a clerk of works or superintendent of construction, which corresponds to our expense for inspection.

It appears, from this last statement, that the Department of Engineering is doing the work at a cost more than 2 per cent less than the minimum fee established by the American Institute of Architects; there is no reason, however, why the department should be expected to do the work properly and keep the cost below the fees charged in private practice.

The state should have the best work in architecture as well as along all other lines. The Division of Architecture is securing this kind of work about as follows:

A full appreciation of the building needs of the various state institutions is secured by frequent consultation with the executive heads and boards of management and by frequent visits of the State Architect and his assistants to the institutions.

The designers in charge of the planning and designing of the buildings, from having been in the state's employ for a considerable length of time, have become specially expert as to the building needs of the state institutions and the best methods of meeting them.

An ample force of draftsmen, architectural, structural, mechanical and electrical, is employed, with the result that working drawings, large scale drawings and full size details, as the basis for bids and contract, are thoroughly complete; this is true also of the specifications which form a part of the basis for bids and contract; the specification writers keep in continuous touch with the market as to all building materials. Since our mechanical and electrical engineers, structural designers and specification writers, also our cost estimators, work in conjunction with our architectural men, all employees being under the continuous charge of the heads of the several departments, we are especially well situated to secure perfect and complete sets of working drawings and specifications with a minimum of lost motion.

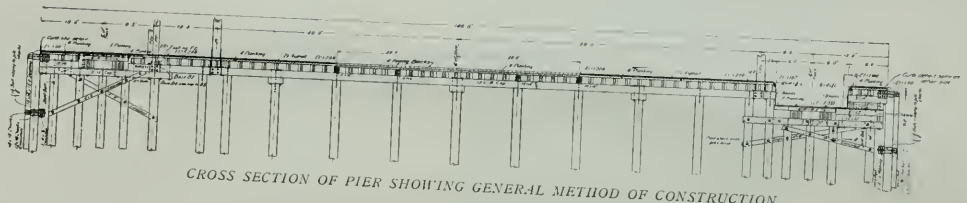
Our drawings more clearly delineate all the details of construction than the drawings which the average architect provides, and on account of the clearness of our drawings and specifications, bidders are able to estimate more closely the cost of the work; the lower bids run very close to each other in practically every case.

The above conditions as to drawings and specifications, taken together with the continual presence at building sites of competent inspectors, make it possible for us, with the least friction and expense, to secure the completed buildings in accordance with the contract agreements. We are greatly assisted in securing this result on account of the services of our testing engineer, who cares for the analysis and testing of materials entering into the construction of buildings, where such analysis and test are necessary to eliminate doubt as to whether quality and combinations of material agree with specification requirements.

With reference to the San Francisco water front improvements, Assistant Engineer Jerome K. Newman gives the following interesting data:

Before proceeding with the preparation of plans for new piers, the question of the proper class of construction to be employed was thoroughly discussed and it was decided that the use of creosoted piling in certain cases would be preferable to the exclusive use of reinforced concrete, which latter has been used, where deemed practicable. There were several reasons for making this decision, viz: the great depth of mud along the water front from the foot of Harrison street to the foot of Grant avenue, entailing excessive cost of construction in concrete on account of the depth and difficulty of foundations, the urgent necessity of being prepared for the opening of the Panama Canal in the very near future, the constant changes in vessels and freight-handling methods bringing with them the possible need of early reconstruction to meet new conditions, coupled with the great expense of such reconstruction in a concrete pier, and last, but not least, the uncertainty among engineers regarding the probable life of reinforced concrete struc-

ELEVATION OF PIERS 16, 18 AND 20 AND BULKHEAD CONNECTIONS



CROSS SECTION OF PIER SHOWING GENERAL METHOD OF CONSTRUCTION

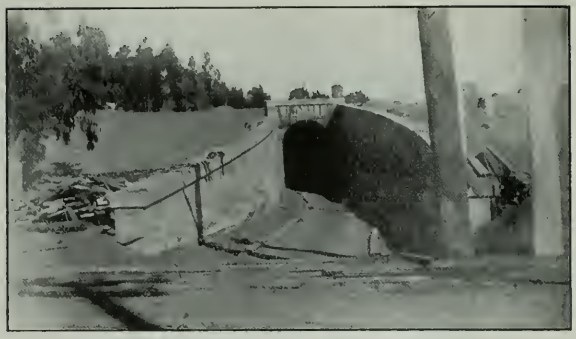
PIERS 30 AND 32, SAN FRANCISCO HARBOR FRONT

tures in sea water. It may be remarked that the choice of creosoted pile construction in certain localities agrees with the recommendation to the Maritime Affairs Committee of the San Francisco Chamber of Commerce by a commission of engineers appointed by it for the purpose of examining conditions and reporting thereon.

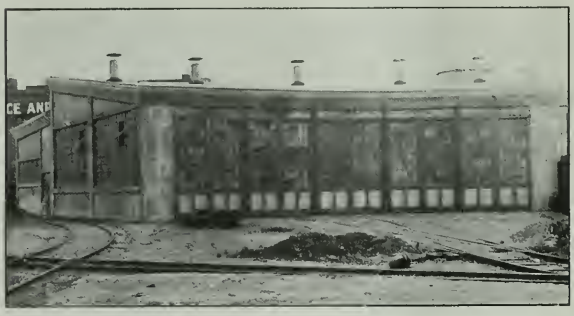
Observations at the northern portion of the front disclosed the fact that there was a strong tidal current at this point, which might endanger wooden pile structures and it was decided to build the three most exposed piers of the seven contemplated for this section of concrete, to act as breakwaters and to deflect the current eastward away from the shore. For this reason piers 29, 35 and 39 have deen designed as reinforced concrete piers, piers 29 and 39 as concrete cylinder piers, resting on wooden piles below the mud line, and pier 35 as a pile pier; and the completion of pier 39 has demonstrated that the object has been attained.

Wherever possible, shipping men were consulted on the most advantageous arrangement of piers, location and character of tracks, sizes of

PIER 26 INTERIOR, SAN FRANCISCO HARBOR FRONT

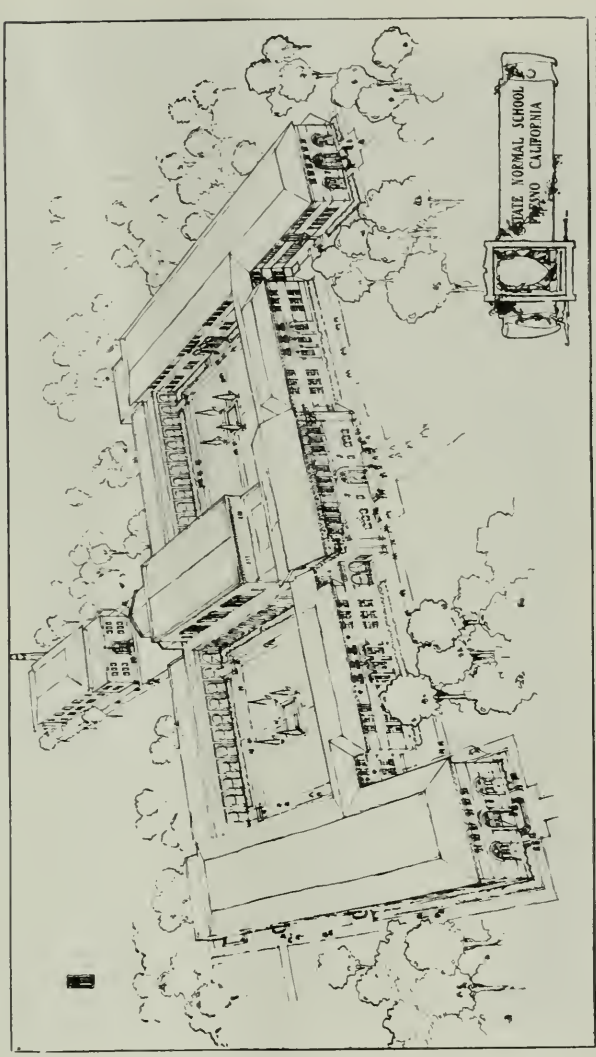


BELT LINE R.R. TUNNEL, WEST PORTAL, SAN FRANCISCO HARBOR FRONT

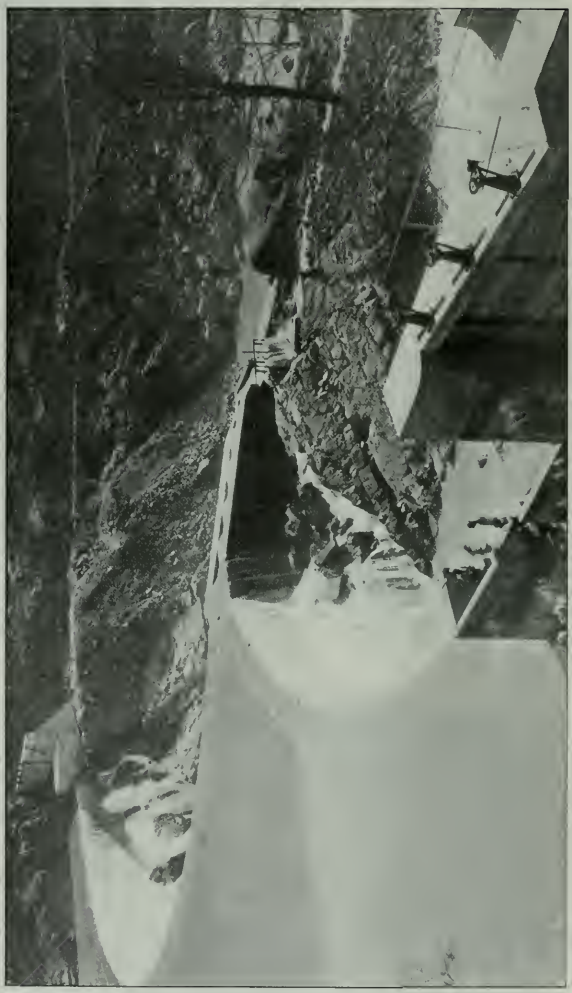


BELT LINE R.R. ROUNDHOUSE, SAN FRANCISCO HARBOR FRONT

BELT LINE R.R. TUNNEL, EAST PORTAL, SAN FRANCISCO HARBOR FRONT

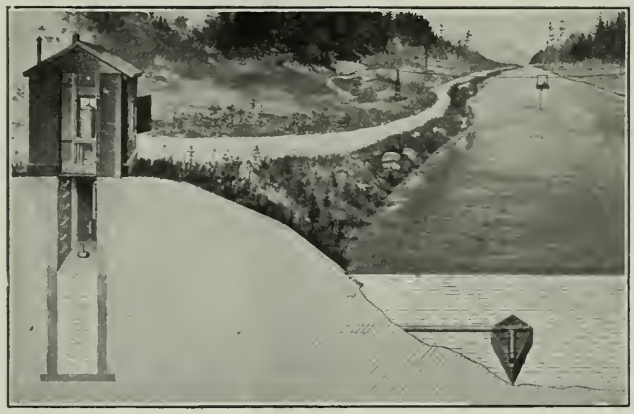


FRESNO NORMAL SCHOOL, FRESNO, CALIFORNIA
Architectural Division, State Department of Engineering



GOODWIN DAM, STANISLAUS RIVER, HEADWORKS SOUTH SAN JOAQUIN AND OAKDALE IRRIGATION DISTRICTS

CLOISTERED SHELTER, EXERCISE YARD, MALE WARDS MENDOCINO STATE HOSPITAL



TYPICAL GAGING STATION WITH WELL AND REGISTER HOUSED

WARD 25, STOCKTON STATE HOSPITAL, STOCKTON, CALIFORNIA

doors, width of slips, etc., and designs were prepared in accordance with their suggestions. All new piers are provided with at least one track and where width permits with two, one surface and one depressed, the latter being generally placed on the northerly side, and provision is made for the possible future installation of cranes for handling freight by building the substructure and shed columns heavy enough to carry them. Doors are of ample size, usually 22 feet high and 20 feet wide and are equipped with steel rolling shutters which possess the advantages of easy operation, durability and low maintenance cost.

Wherever necessary, the contract for a new pier has included the reconstruction of the adjacent bulkhead wharf either in timber or concrete, depending on circumstances. The wharf connecting with pier 49 is of creosoted piling, those connecting with piers 15, 30 and 41 are of reinforced concrete.

Creosoted pile fenders protected by untreated Oregon pine sheathing have been employed in place of the untreated fender lines heretofore used and wood block pavements in the driveways of wooden piers have been substituted for planking. A large percentage of the total cost of repairs is expended on fenders and planking and it is certain that even with the increased first cost, the above changes will result in materially decreased annual cost, the creosoted piling having ten to twelve times the life of untreated piles and the block pavement four to five times that of planking.

To add to the attractiveness of the front, the old ugly type of shed front was abandoned and the pier fronts south of Market street are to be built in modified mission style, those north of Market street being designed on the lines of the Chelsea piers of New York.

* * *

Going Up (?)

In a recent article on cement prices a New York contemporary turns back ten years to the great building boom of the year 1905 and the demand for all sorts of building materials then existing, and commenting further upon the opportunity now before us for economical construction, it takes the list of the ten leading building commodities and shows that they are all practically lower in price now than they were ten years ago. It states, however, that nearly all materials are beginning to go up and urges all its readers to build promptly ere labor and real estate cost more and the cycle of prosperity with all its attendant advances in prices makes construction too expensive.

Distinguished Architects Hold Coast Meetings

By WILLIAM MOOSER, M. A. I. A.

THE recent visit to San Francisco and Los Angeles of the officers and members of the American Institute of Architects was a notable one and will linger long in the memories of those who met and helped entertain the distinguished party. The Institute officers present included the following:

President	R. Clipston Sturgis, Boston.
Vice-President	Thomas R. Kimbal, Omaha.
Secretary	Burt L. Fenner, New York.
Treasurer	J. L. Mauran, St. Louis.
Director	John H. Rankin, Philadelphia.
Director	Octavius Morgan, Los Angeles.
Director	W. R. B. Willcox, Seattle.

Mr. C. H. Whitaker, editor of the "Journal," and some forty other members and ladies came by steamer from the North. The San Francisco Chapter of the American Institute of Architects had arranged a meeting on Friday afternoon, October 8, at the St. Francis Hotel, and to which it had extended an invitation to be present, all practicing architects, draftsmen and students. More than 200 attended. Mr. W. B. Faville, President of the Chapter, presided and in a few well-chosen words introduced President Sturgis of the Institute, who delivered an able and exceedingly interesting and instructive address upon the aims and purposes of the Institute. He dwelt upon the practice of the profession in general, and his talk was received with much enthusiasm.

On Saturday, October 9th, the Chapter held a meeting at 11 A. M. for the purpose of hearing from the "Institute Officers" regarding the proposed reorganization of the Institute, and its proposed new constitution and by-laws, the object being to broaden the scope of the Society, and admit to its membership all those belonging to the Chapters. It is believed the reorganization will be accomplished at the coming convention at Washington, D. C., in December. Secretary Fenner and Treasurer Mauran explained in detail the proposed changes, the reorganization plan, etc.; after which a general debate took place. An adjournment was taken for luncheon and addresses were made by President Sturgis, Secretary Fenner, Treasurer Mauran, Directors Morgan and Willcox, and President Faville.

On Sunday a breakfast was held at the California Building at the Exposition, arranged by the San Francisco Society of Architects and attended by its membership, the officers and visiting members of the Institute, and the officers of the local Chapter.

At this affair, President Meyer, on behalf of the membership, extended the Olive branch to the Chapter with the announcement that henceforth their watchword would be "Harmony" in the ranks of the profession in San Francisco, and that he and others would again gladly attend the meetings of the Chapter and do all in their power to help build up the Institute and encourage its aims and purposes on this Coast.

Mr. John Galen Howard and others seconded this statement and on behalf of the Chapter, President Faville welcomed the joyous outcome.

The officers of the Institute congratulated all, and President Sturgis, in well-directed and thoughtful remarks, pictured great things in store for the good of the profession in general, and the Institute in particular, through this most happy reunion of the architects of San Francisco.

Monday was devoted to an automobile ride around the city and out to Golden Gate Park, and the beach, luncheon being served at the Cliff House, after which the ride was continued through the Park, Presidio and to the Exposition. At 3:30 Vice-President W. H. Crocker, on behalf of the Panama-Pacific International Exposition, presented President Sturgis with an engrossed testimonial evincing appreciation of the Institute's splendid work for the last fifty years in behalf of architecture and its allied arts. With reference to the architects' part in making the Exposition, Mr. Crocker said:

"The invaluable and lovely work of the architect is illustrated well at this great exhibition. He has planned the very life and face of the show. Without the assistance of the architect little would have been accomplished. The Panama-Pacific Exposition is a monument to the efforts of the 'world's builder'—the architect and designer."

After remarks by President Sturgis and W. B. Faville the band played, and all went on their way in a happy mood.

The visiting party left on Tuesday morning for Los Angeles and San Diego, greatly pleased with their visit and with the heartfelt thanks and good wishes of all architects in this vicinity, for their helpfulness and renewed efforts to stimulate the profession on this Coast.

* * *

United States Timber in East Worth Millions

THE merchantable timber acquired by the federal government in the purchase of land for National Forests in the White Mountains of New Hampshire and the southern Appalachians amounts to more than a billion board feet, worth upward of $3,000,000 on the stump, according to an appraisement by the Forest Service. In addition, there is an enormous quantity of inaccessible and widely scattered timber which can not be considered marketable until regional developments and improvements place it within reach.

Plans for cutting some of this timber in accordance with scientific forestry methods already have been prepared and in a few localities operations have been started. In some places it has been found necessary to remove mature trees in order to give the young growth a chance. This work is being done largely by local residents, who have bought the stumpage and are converting it into lumber. The construction of roads and trails is making more and more timber accessible to lumber operators, but the principal use of these improvements at present is for local communication, fire protection, and to open up the wild land for recreation use. A secondary influence of the improvements is to increase the value of the land and to make the timber on it more accessible and valuable to operators.

A great deal of the forest land within the purchase areas was cut over or culled before the government acquired it. Nearly all of this class of land, however, is covered now with young growth and even the abandoned farm acreage, which forms about two per cent of the whole, is slowly reverting to forest.

Of mature timber which could be placed on the market at once, the eastern national forests contain a total of about 1,100,000,000 board feet, which includes all the common eastern hardwoods, together with much spruce, a good deal of hemlock, and some pine. The land, including the timber, has been bought at an average price of a little more than $5 an acre. More than 5,000,000 acres of this land will eventually be acquired for national forests in the east, if the recommendation made by the National Forest Reservation Commission in its last annual report is carried out.

Architectural Terra Cotta

By MR. OSWALD SPEIR*

EACH year the present system of steel architecture, clothed and made beautiful with brick and terra cotta, commends itself more and more to client and architect. When weathered, ground and shaped by intelligence, it becomes one of the most perfect and enduring building materials. Fire cannot burn it, nor weather destroy it. Triumphantly it survives frost and mocks at decay. In the ruins of Assyria, Babylon, and Nineveh, debris has been found which bears still, ineffaceable characters and records of those strange people who are so remote from the present that they seem to have lived in some other planet. Nothing in our museums is more jealously guarded than those clay tablets whose inscriptions learned professors have spent years in deciphering, and from which we know what manner of civilization they commemorate; nay, further still, the antiquarian goes back to ruins which antedate all that is yet known of the history of man, although upon them are clearly traced the records of four thousand years.

The Assyrians, Phoenicians, and Babylonians, as well as the Egyptians, employed terra cotta in various ways, for both in and out door use, as well as in architecture; Sarcophagi, utensils for the house, and garden ornaments, were among them. But to all these offices was added the preservation of records by means of slabs or cylinders of the same material. On these were stamped by the stylus, hieroglyphic signs indicating all that remains to the moderns of those personal events, wars and dynasties which give the data for chronology. Distinguished archeologists are sent by governments to critically supervise the Mussulmans as they upturn the old dust of temples, palaces and mausoleums, to find still further records laboriously traced in the world's earlier youth, upon a substance which outlives pillars of steel or of granite. In Chaldea, also, terra cotta was employed for interior and exterior of all kinds of buildings. Colored bricks were arranged in simple but effective patterns, creating pleasing effects. They were easily cleansed, inexpensive, and durable. The Etruscans produced statues in terra cotta very creditable to their technical knowledge of the art. The Greeks must have used terra cotta from time immemorial. Homer mentions sun-dried brick, and life-sized statues have been found formed from native clay. Figurines, grotesque and beautiful, and Tanagras were frequently deposited in the tombs, even as late as the second century. As an architectural material, however, except for cheneaux, acroteria and sometimes for frieze, terra cotta was used but little by the Greeks, their beautiful marble being so accessible.

The Romans, however, very freely employed brick and terra cotta. The arch of the Cloaca Maxima, the oldest piece of masonry extant in Rome, is made of tile or coarse terra cotta, thin, large and oblong in shape, peculiar to that date. Many of the walls of temples, palaces, arches, monuments and tombs are of the same material.

In some cases these walls were faced with marble which has become defaced, the more enduring clay material still remaining. In the early development of Roman construction, clay material was frequently used as a decoration, sometimes colored with simple pigment or a wash paint.

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*Paper read by Mr. Oswald Speir, Los Angeles, representative of Gladding, McBean & Co., at a meeting of the Southern California Chapter of the American Institute of Architects, Los Angeles, September 14, 1915.

Early History and Development in the Old World

During the long following period, the clay industry suffered a decline. It was reserved for the fertile plains of Lombardy, which was almost destitute of stone, to carry forward the manufacture of terra cotta to its greatest measure of success during the four centuries from the twelfth to the sixteenth. It was then used in construction and decoration in a manner original and exquisite. Some of the church fronts and spires and campaniles of Pavia, the hospital and Castiglione palace of Milan, and the beautiful Certosa, and many of the villas and private houses were built during the latter portion of that period. It may be called the golden age of terra cotta. Among all these interesting examples, that of Certosa stands eminent. This monastic building was the most superb ever erected by any order, and served to shelter only thirty monks; yet since its foundation, some five hundred years ago, the rich decorations of its matchless cloisters have served a higher purpose, that of typifying the existence of art in stone and clay.

But the father of real artistic work in terra cotta was Luca della Robbia, who was born in Florence at the beginning of the fifteenth century, probably about the year 1400, and who died in the year 1481. As a sculptor he was not regarded as the equal of his contemporaries, Ghilberti and Donatello, but his name is even more widely known, through his experiments and his discoveries in ceramics.

While yet a boy, Luca, following the fashion of many art students of his time, became the apprentice of the best goldsmith of his native city. For the boy did not then disdain to climb by patient, toilsome steps to the height of his career, through the minute details to be acquired by cunning workmanship in gold, silver or even brass.

Becoming dissatisfied with his profits in bronze, and marble, and reflecting that it cost but little trouble to work in clay, which is easily managed, and that only one thing was required, namely, to find some method by which the work produced in that material should be rendered durable, he studied with so much good will on the subject, that he finally discovered the means of defending such productions from the injuries of time.

After having made experiments innumerable, Luca found that if he covered his figures with a coating of glaze, formed from the mixture of thin, litharge, antimony and other minerals and mixtures, carefully prepared by the action of fire in a furnace made for the purpose, the desired effect was produced to perfection and almost endless durability might thus be acquired, and secured to works in clay. For this purpose, then, Luca, as being its inventor, received the highest praise, and indeed, all future ages will be indebted to him.

His first known essays in the so-called "Robbia" ware were made about the year 1436, after that long study and repeated experiments which usher in all inventions of genuine merit.

Ten years later, Luca's first painted tiles in the ware which bears his name, and which was made for Benozi Fraderighi, Bishop of Fiesole in the Church of San Francesco e Paolo. This tomb was among the finest monuments in Tuscany. From that time his skill gave him a fame which has survived all minute knowledge of his life, save as it is known by his works. By comparing all other pottery of the time with that made by him, the character and solidity of the works of della Robbia are manifest. Indeed, like our modern potters, his secrets were so well kept that for one-fourth of a century no other artisan in clay manufactured ware surfaced with a similar enamel. What he may have learned of the Moorish potters of Spain, we

have no means of knowing. It is a matter of fact that they had obtained great skill in the manufacture of what we now call terra cotta, and many very beautiful examples are found throughout Spain, not only in their pottery and tiles, but in some of their very beautiful temples and palaces.

Gradually the process of della Robbia became known and was adopted in other potteries of Italy and France. Meanwhile the nephew, Andrea, with his four sons, carried on the work. Luca, the younger one of the four sons of Andrea, may be really the author of many of the reliefs attributed to the elder. There are many distinguishing marks in common. Under the other relatives, however, art work in terra cotta began to decline.

After the sixteenth century, and the change in architectural style, the designing of more elaborate structures which mark the florid treatment which had come into vogue, carried the demand far beyond the experience of those artists and artisans who were engaged in the work. It gradually spread into other countries, however, even in its decadence. One of the Lucas introduced it into France, where the Chateau de Madrid was decorated by him under Francis I. Yet its use has never been abandoned; in the south of France, north of Germany, and along the Baltic, it is found in all kinds of buildings in balustrades, balconies, turrets, spires, and in mural decorations of various kinds. It makes, in its soft shade and divers forms, a pleasing and varied effect, quite different from the cheap ginger bread work of cheap wooden villa decorations, as its substance is more substantial. Less than a century since, a pottery was started in Milan for the making of terra cotta in that city. In England it was practically two hundred years since coarse earthen ware was produced, yet when Wedgwood concentrated his energies upon refining the quality of terra cotta, its improvement was marked and rapid.

Early History and Development in the United States

Within the last few years, the Doultons have obtained widespread fame from the productions of their potteries in Lambeth. In fact one of the earliest is of ware which came from Stamford, England, used in the Fine Arts Museum of Boston, of which Messrs. Sturgis & Brigham of Boston were the architects. This was the result, however, of an early revival in this country, which had been brought about by Mr. Renwick, architect of St. Patrick's Cathedral, through his knowledge and delight in the material, as the result of his study of Italian work. At about the period 1850 to 1855, he caused terra cotta to be made by potters who had had no previous experience in the art, for such buildings as the St. Denis hotel, Cooper Union, Trinity building, and several other similar constructions. These attempts were not very successful, however, and a lull in its use occurred. It was revived by its use in Boston in the Fine Arts Museum, and perhaps more legitimately we might say that the spasm of cast iron, which swept the country in the early seventies, developed a demand which terra cotta filled. The Perth Amboy Terra Cotta Company was started in 1879, under the encouragement of such men as G. B. Post, McKim, Mead & White, H. H. Hardenburg, F. H. Kimball, Carrère and Hastings, Cyrus Eidlitz, Burnham, Sullivan and many others.

During this period we saw some of the best results that have been obtained in modeling and sculpture.

Modern Practice

We have the material; modern construction, owner and architect are demanding its use, but our problem is its most legitimate use. Just as we frequently use stone where brick would have been much more effective, so

we often use terra cotta where stone would have been more suitable and vice versa.

Before, however, entering upon any discussion of the merits of terra cotta, a short explanation is necessary of the point of view from which this discussion is taken. It will be necessary to make it comparative, and to show that in certain respects and for certain purposes terra cotta is preferable to stone; but it must not be supposed that we are foolish enough to claim that the comparison is all in favor of terra cotta, or that for certain purposes the use of appropriate kinds of stone is not to be preferred. Stone has obvious advantages in the construction and ornamentation of a building, with which brick and terra cotta cannot pretend to compete, and it is absolutely essential to the proper use of terra cotta in this country that the strong and weak points of the two classes of material should be clearly understood. Such an understanding would be extremely beneficial both to the terra cotta and the stone industries, because the two materials are at bottom supplementary, rather than competitive. Terra cotta is not a substitute for stone. Under certain conditions and for certain architectural effect terra cotta should not be used. Under other conditions and for other architectural effects, stone of one kind or another should be used. The trouble is that many architects and many more laymen do not fully understand what the comparative merits of the two materials are; and consequently they frequently use stone when terra cotta would have better served their purpose, or they use terra cotta when a more appropriate effect could have been obtained with stone. Nor is that all. The comparative use of the two materials is confused by the fact that terra cotta is cheaper and more flexible material than stone and that consequently it is often used as a substitute for stone, not because the architect wants to use terra cotta but because he cannot afford to use stone. Under such circumstances, he usually compromises by specifying a kind of terra cotta which is made to look as much as possible like stone; and the manufacturer of terra cotta is required to produce a "sham" material in which the substantial and characteristic merits of each material is sacrificed for the sake of putting up a false appearance. The terra cotta makers naturally dislike to manufacture a material for which they obtain no credit, and which has no advantage save cheapness; and for years they have protested against the merely imitative use of terra cotta. Their protests have had some effect. Terra cotta is now being used more intelligently and more appropriately, as well as more extensively, than ever before; and what is still more important, it is being used more largely just because it is being used more appropriately. As a substitute for stone, and consequently as the competitor of the many compositions which are now being placed on the market, it has no future at all; but as an independent material, which for certain uses, both esthetic and practical, has indisputable and peculiar merits. It has a future, which is only limited by the future of American fireproof construction.

I have already referred to the fact that terra cotta is frequently specified instead of stone merely, and only, because it is cheaper, but this matter of the comparative economy of terra cotta deserves further consideration. Its comparative cheapness, while it is one great source of the popularity of terra cotta, is also the principal cause of its abuse as a building material, so that it cannot be called an unqualified advantage. It leads to the manufacture of very inferior grades of the material for the ornamental adornment of cheap buildings; and it has had the disadvantage of associating terra cotta in the minds of certain people with various cheap types of construction and habitation. As a matter of fact, terra cotta, while it can be cheapened

like any other manufactured article, is only really economical when it is very well made and when consequently a comparatively stiff price is charged for it. Terra cotta, which has been properly put together and burnt, is more durable than stone, but such a quality of terra cotta, while it is economical, is not necessarily cheap. It may cost what seems to be a large sum, but in that case it will be worth the sum it costs. The question of its expense as compared to stone is one into which we do not need to go in detail. It all depends upon many varying considerations, such as the amount and character of the material required, the location of the nearest available quarries, and the extent to which the material must be ornamented.

The question which the architect should as a rule seriously ask is not whether terra cotta is cheaper than stone, but whether it will be possible for him to obtain in any other material an equally satisfactory service and effect for a similarly economical price.

The characteristic advantages of terra cotta depend upon two fundamental facts,—the fact, in the first place, that it is capable of being moulded before it is hardened, and the fact that, in the second place, it is hardened by a process of burning and firing. The first fact is responsible for its flexible adaptation to architectural ornamental forms while the second fact is responsible for its durability and for its high value as an ornamental, or something more than an ornamental adjunct to a system of fireproof construction.

The fact that terra cotta is in a soft and plastic condition, before it is burnt, and that consequently it can be moulded into a desired shape at a comparatively small expense, is the chief source of its availability for purpose of architectural ornament. The same sort of ornament can be cut in stone, but only at a very considerable cost. The moulders of terra cotta work with comparative rapidity, and a mould when it is once finished can be used, if desired, for many duplicates of the same ornamental detail or motive. It affords the architect the opportunity of examining the full-size reproduction of the form or the ornament he proposes to use while the clay is still in a pliable condition, and he can in this way assure himself that his detail is properly designed and vigorously and correctly modeled. It need not be finally burnt and hardened until he is absolutely and finally satisfied with his own work and that of the modeler.

In the earlier stages of the use of terra cotta in this country, it was the foregoing advantage which chiefly appealed both to the architect and the builder. It afforded them a method of ornamenting a building by means of solid form and without going to the expense of stone carving. Stone carving was generally preferred, because it was possible in this way to obtain greater accuracy of line and a more precise and subtile effect; but in a great many cases accuracy of line and precision of effect were not desirable and in such cases terra cotta had a field of use which was absolutely its own. Its flexibility and economy for ornamental purpose remains one of the main sources of its popularity, but with the development of the art of fireproof construction, it has been found that terra cotta had various other advantages, both esthetic and practical, which enormously enlarged its special field of service. Other characteristics, such as its durability, its lightness, and its fire-resisting qualities, began still more to commend it to builders and curiously enough, it began also to be discovered that it was as a rule artistically most effective when it served most excellently the foregoing practical needs. It was in buildings, the ornament and structure of which needed to be particularly light, durable and uninflammable, that the texture,

the color and the form of terra cotta ornament or surface covering proved to be most useful to the architect.

That terra cotta is, when properly made, more durable, lighter and less easily damaged by fire than stone, does not need any elaborate proof. Its consistency and its hollowness necessarily make it light. For convenience of burning, it must be made hollow and only moderately thick, and a given bulk, consequently, weighs very much less than a similar bulk of stone. A block of granite, for instance, containing one cubic foot, weighs about 168 pounds; a block of sandstone somewhere between 100 and 170 pounds, and a block of limestone about 144 pounds. A solid block of terra cotta of the same size would weigh about 120 pounds, while the hollow terra cotta cube, such as is ordinarily used, does not weigh more than 70 pounds. As to its durability and indestructibility, that again is a direct result of its process of manufacture. The heat through which a well-made block of terra cotta is passed, is so much higher than the heat to which a building is likely to be exposed, that the material is well prepared to withstand any further vicissitudes of that kind.

A light, durable, uninflammable material is rendered, of course, peculiarly necessary by the characteristically American system of fireproof construction. A building, the walls of which are carried upon a towering steel structure, has very different needs from a building of ordinary construction. The old masonry house cannot economically rise above a certain moderate height, and in a building of moderate height, the mere weight of the masonry is an important source of architectural effect. It is no wonder, consequently, that the architects of such buildings have used stone wherever stone was economically available. But in the case of a building, the weight of which is carried on a steel frame, walls and partitions composed of light and peculiarly fireproof materials are desirable, both for the sake of economy and for the sake of appearance. The lighter the walls, the lighter the cage which has to carry them. These walls are only curtains, or screens, and like all curtains and screens, should be comparatively slight, rather than heavy, both in appearance and reality.

The demands of this form of construction and of its appropriate decoration, are at present better satisfied by terra cotta than by any other material.

The consequence is that the tallest and best designed sky-scrapers recently erected throughout the United States, both in New York and Chicago, have been encased in terra cotta. Sometimes stone is used for the few lower stories, because architects like the effect of a heavier looking base. But above in such sky-scrapers as the Woolworth building, Wanamaker store, both in New York and Philadelphia, the building of the International Banking Company, the Times building in New York, the Railway Exchange buildings in Chicago and our most important buildings on the coast, the whole superficial effect of the structure is obtained from a terra cotta coating. Moreover, this terra cotta is being used to the very best advantage. A few years ago in any of the large office buildings, it was customary to crown the structure with terra cotta ornament on a large scale, but no matter how well designed or how well made this ornament was placed too far from the street to be effective. Now the tendency is to make the terra cotta effective chiefly by means of a consistent and pleasant color tone. There is little attempt to give any depth to the surface of the building by heavy ornament. The decoration is kept frankly superficial and is obtained, if not simply from color, mass and salient line, then

from the arrangement of the terra cotta blocks into proportions, scale and color. This method of decorating a sky-scraper, which has the merit of being at once economical, effective and appropriate, is capable of much further extension—particularly when architects become more accustomed to the use of glazed and colored terra cotta.

* * *

Architectural Competitions

AN interesting example of what competitions for schoolhouse plans should not be is afforded by an invitation issued by the school board of Marquette, Mich. On July 29, the following resolution was adopted and sent to nine architects in the Middle West:

"Resolved, That nine architects be asked to submit floor plans and sketches of high school building in black and white, and estimate cost of said building upon a competitive basis. Three prizes of $50 each to be paid for three best sketches, except that the architect to whom the contract is awarded shall not receive a prize. The board of education shall be the sole judge in the competition with such experts as it may see fit to engage. Preference will be given to plans and sketches of architects who make personal visit to the proposed site. Sketches must be submitted on or before August 12, 1915. All sketches to be the property of the board of education."

The special features desired in the high school building are the following: Gymnasium, assembly room, domestic science rooms, commercial room, chemical laboratory, physical laboratory, biological laboratory, lecture rooms, music rooms, medical examination room, shower baths, locker rooms, dining room, debating room, classrooms, book room, and museum.

This resolution, comments the School Board Journal, violates practically every known principle of architectural competitions. To persons who are at all familiar with the customs of architects it displays a lamentable ignorance, assuring in advance the defeat of the very purpose it is intended to achieve and affording loopholes for unfairness on the part of the competitors and favoritism on the part of the board members.

Without entering in detail into the defects of the resolution it may be said that the board presupposes that architects are tradesmen who are willing to prepare and submit plans for examination, just as a merchant presents samples of merchandise. They offer to six architects no compensation for sets of sketches, which, if technical preparation and experience are added to the cost of actual drawing, are worth not less than $3,000 each for a building costing $100,000. Five laymen set up themselves as sole judges of plans that involve difficult technical problems such as can be judged accurately and completely only by an expert. The members, if they may see fit to engage experts, do not agree to follow their advice. An outline of the requirements is not offered equally to all competitors, but such as visit the site are to be preferred. Only two weeks are given to a problem that cannot be well studied in any architect's office in less than a month or six weeks' time. Finally, the board does not absolutely agree to accept one of the sets of plans and may, if it desires, throw out all plans.

An architectural competition is the least satisfactory of the several methods of obtaining plans for a new schoolhouse. It is frequently necessary when many architects press their claims, but it is only successful when conducted with rigid fairness and with due consideration of all the principles formulated by the American Institute of Architects. These principles are not the arbitrary dictum of a portion of the architectural profession; they are the result of many years of experience and observation and simply state the conditions which will assure fair and honest conservation of the rights and interests of the architect and of the owner.

Space prevents a discussion of the principles of architectural competitions. A few of the most important can, however, be restated because they are most commonly overlooked by school boards:

First, competitions must recognize the professional and technical character of the services rendered by architects.

Second, the program must contain a complete technical statement of the problem, and fix fair, definite conditions under which the drawings are to be submitted. A man familiar with competitions should be called upon to draw up these conditions.

Third, the architects invited should be competent and honest, and evidence of these qualifications should be required.

Fourth, the selection of plans should be in the hands of a competent expert, who has had training, experience, and a pre-eminent reputation as a schoolhouse architect.

Fifth, the competition should be a definite contract between the architects and the school board, and should provide for the employment of the successful competitor or for adequate compensation for the drawings, if the project is abandoned.

As a basis for competition, the resolution of the Marquette School Board is defective in every one of these five essentials. It is of a character that will permit no self-respecting architect who values his professional reputation to enter, and will undoubtedly be condemned by the American Institute of Architects. Instead of an impartial competition, it will provide for a scramble in which the man or the firm that can furnish the flashiest drawing and make the most extravagant promises, will win. If we were not certain that the members of the board are wholly honest and upright we should say that the competition has all the earmarks of political jobbery.

* * *

Program for American Builders' Week

THE week of October 18-23 will be a memorable one in San Francisco for those in any way identified with American building construction. Thousands of visitors from all parts of the United States are expected to be present, including many prominent architects, engineers, contractors and all the building trades. The following splendid program has been arranged:

Monday, October 18th

Assemble at the Palace Hotel. Registration and assignments.

Reception in hotel ball-room all day and evening under supervision of the local ladies' auxiliary, which will have charge of arrangements for entertainment of visiting ladies during the week. (Light refreshments.)

Visit General Contractors' Association and Builders' Exchange, both within half a block of Palace Hotel.

Visit the Exposition. Special program.

Tuesday, October 19th

10.00 A. M.—Opening of Congress at the Municipal Auditorium. Introduction of chairman by John D. McGilvray, Sr., chairman general committee.

Addresses of welcome: Governor Hiram W. Johnson; the Hon. James Rolph, Mayor of San Francisco; Charles C. Moore, President Panama-Pacific International Exposition.

2:00 P. M.—Technical addresses: The following topics have been selected for addresses, papers, etc., to be delivered during the Congress:

(1) "Organization as Applied to Construction Work." (Major-General George A. Goethals has been invited to prepare a paper upon this subject.)

(2) "The American Builder"—by R. Clipston Sturgis, President American Institute of Architects.

(3) "National Organization in the Building Industry—its Needs"—by H. L. Lewman, President National Association of Builders' Exchanges.
(4) "The Building Business as a Factor in the Commercial Life of the Country"—by Charles W. Gindele, President of the Building Construction Employers' Association of Chicago.
(5) "The Engineering Contractor"—by Halbert P. Gillette, author of "Cost Data," editor-in-chief of "Engineering and Contracting" and founder of American Society of Engineering Contractors.
(6) Announcements by the chairman.
8:30 P. M.—Grand ball in the Municipal Auditorium.

Wednesday, October 20th

9:30 A. M.—Bay excursion.
1:00 P. M.—Informal lunch at Old Faithful Inn on Exposition grounds.
2:30 P. M.—Addresses:
(1) "Clay Products and Their Modern Application," by Walter E. Dennison, Second Vice-President National Terra Cotta Society.
(2) "The Fireproof Value of Concrete," by Lewis R. Ferguson, Assistant Secretary National Association of Portland Cement Manufacturers.
(3) "Metal Products as Applied in Buildings," by John B. Leonard, M. Am. Soc. C. E.

Thursday, October 21st

9:30 A. M.—Grand parade to Exposition, illustrating the importance and development of the building industry.
Reception by the directors and officers of the Exposition.
Ladies' reception at the California building (Exposition grounds). Dancing all day.
3:00 P. M.—Addresses:
(1) "The Efficient Conduct of Building Operations," by Grant Fee, President of Building Trades Employers' Association of San Francisco.
4:00 P. M.—(2) "Bonding the Builder—Its Origin and Present Effect upon Building Contracts," by Henry A. Jacobs, attorney for the California Building Laws Association.
8:00 P. M.—(3) "Opening Bids in Public as Essential to Proper Business Conditions," by George W. Kelham, chief of architecture, P. P. I. E.
9:00 P. M.—(4) Economic Side of Fire Protection," by John C. McCaughern, district manager Board of Fire Underwriters of San Francisco.

Friday, October 22nd

10:00 A. M.—Automobile sight-seeing trip.
10:00 A. M.—Addresses: "The Building and Maintenance of Good State Highways and Bridges," by A. B. Fletcher, M. Am. Soc. C. E.
11:00 A. M.—"Men Who Build, and Their Legal Responsibilities," by John L. McNab, formerly U. S. District Attorney.
2:00 P. M.—"Electricity as a Factor in Building Construction," by John A. Britton, Vice-President and General Manager Pacific Gas and Electric Co.
3:00 P. M.—"Pacific Coast Lumber at Home and Abroad," by R. A. Hiscock.
8:00 P. M.—"Modern Plumbing in its Relation to Building Construction," by John L. E. Firmin, State Secretary Association of Master Plumbers of California.
9:00 P. M.—"The Building Contractor and the Architect," Felix Kahn of Macdonald & Kahn.

* * *

Concrete Resists Earthquake Shocks

As at Messina, Italy, Kingston, Jamaica and in the great San Francisco earthquake years ago, reinforced concrete was shown to be the safest type of construction in regions subject to such disturbances, so again in the case of the earthquake in the Imperial Valley region of Southern California last spring, concrete showed its character as an earthquake-resisting building material. While nearly 100 buildings were wrecked or seriously damaged, brick work and timber construction suffering severely, the reinforced concrete buildings stood better than any other form of construction and this was especially the case at El Centro, where the new plant of the Holton Power Co. suffered no damage and where the Hotel Barbara Worth, also a reinforced concrete building, stood undamaged.

The Brick House at the Panama-Pacific Exposition

FOR more than two months the model brick residence at the Panama-Pacific International Exposition has been open to the inspection of the thousands of visitors who have thronged the exposition grounds. Those who have visited the exposition since the first of August and returned to their homes in various parts of the country, have expressed a very considerable curiosity regarding the cost of the house and, incidentally, its object.

Up to and including August 31 a total of $8,899.50 was contributed in actual cash (or in material that was shipped to Chicago and sold for cash): Labor with an estimated value of $1,700 was donated by the Bricklayers, Masons and Plasterers' International Union of America: Construction material, including sanitary fixtures, exterior and interior woodwork, ornamental terra cotta, garden appurtenances, etc., to a valuation of $3,200, was donated by manufacturers and dealers located in California.

The architects who drew the plans aimed at a cost of $5,000, and to this was added, perhaps, $1,500 to cover the estimated cost of a detached garage situated in what was known as a "service court." This garage was made necessary in order to give the building an over-all length which would prevent its being dwarfed by the immense exhibition buildings that surrounded it.

A writer who has lived with the exposition from its early planning until the present time and who has absorbed the magnificence of its architecture, has written of this model house:

"Between the golden dome of Massachusetts State House and the waters of the bay, there is a lawn which seems to have been spread for a little building that must have been lowered into place upon a gossamer of reposeful fancy. It has no domes nor columns, no suggestion of massiveness nor of the marvelous. From the simple shingles of the clay tile roof, whose eaves are permitted by low walls of autumn-tinted brick to encompass a nestling brood of peeping windows, to the flowering vases and window boxes of terra-cotta, there comes a suggestion of shelter—warm, intimate and complete. Everything, from the terra-cotta fountain to the brick garage—from the tesselated tables in the diminutive walled garden to the brick-paved walks and drives—speaks of a place in which to live." The Brick and Clay Record says:

Everyone who has visited the Pacific Coast knows that a combination of climatic conditions and foreign influence have made a deep impression upon the domestic architecture.

The severe climate of the New England states and the inheritance that comes to the inhabitants of that part of the country from their forefathers, have given them a distinctive architecture. It is "Colonial"—essentially English and largely brick.

In California the wooden bungalow has developed into a thing of surpassing beauty. The frame building coated with cement stucco has been brought to a point of perfection little known in any other part of the country.

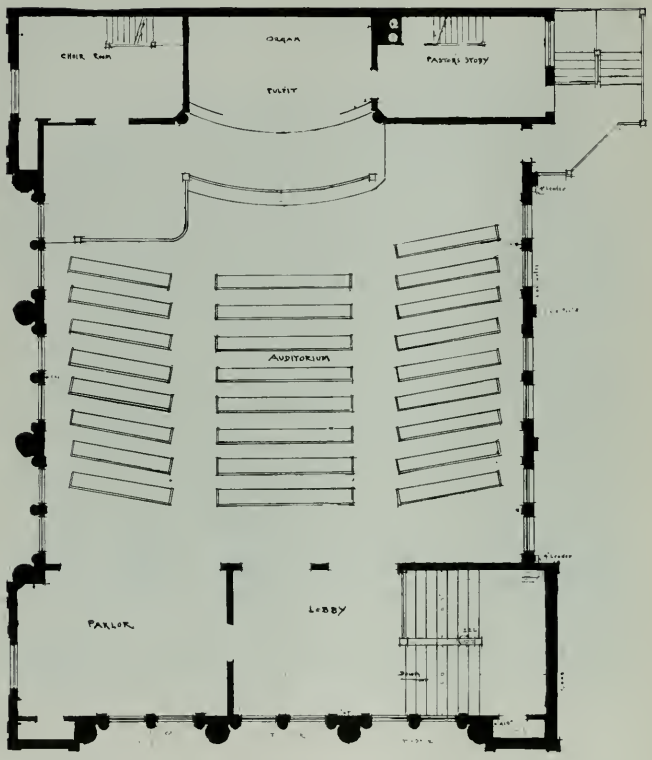
Men who believe in fire resistant construction and in the beauty and economy of clay products, feared the result of the "education" that would be given millions of prospective home builders by direct contact with California domestic architecture.

For that reason it was thought that this was the time for the development of a style of house that would be modest both in outline and cost; that would be fire-resistant to the highest degree possible with a comparatively small expenditure, and which, being copied in perhaps a thousand cities, would not be so startling in its novelty, hence we have this all clay house at the Exposition.

EMANUEL CHURCH OF THE EVANGELICAL ASSOCIATION, SAN FRANCISCO
Falch & Knoll, Architects

Emanuel Church of the Evangelical Association

THE accompanying plates of the Emanuel Church of the Evangelical Association of San Francisco have every appearance of a substantial stone edifice. As a matter of fact, however, there is neither steel nor stone in the building, the frame being of timber with metal lath and cement plaster exterior. The stucco is marked off to imitate stone, and this, with the classic lines, give the substantial effect. The original plans called for a class C building with stone veneer but lack of funds necessitated economy and not only was it necessary to substitute cheaper materials but the true Florentine lines had to be to a more or less extent eliminated and by so doing the beauty and symmetrical proportions of



FLOOR PLAN, EMANUEL CHURCH

the edifice were in a measure spoiled. However, all points considered, the architects, Messrs. Falch and Knoll, have successfully carried out a modified Florentine Gothic style that is pleasing. Two coats of the Muralo Company's concreto are used to give the required stone coloring to the cement work. The edifice contains a large Sunday school assembly room, class rooms, young ladies' and men's social parlors, kitchen, main auditorium with seating capacity of about 300, pulpit, choir rooms, pastor's study and a spacious lobby. The auditorium is finished in imitation stone and wood trim. There are nine beautiful art glass windows. The edifice cost complete, $20,000.

INTERIOR, EMANUEL CHURCH, SAN FRANCISCO
Falch & Knoll, Architects

The Chute and Tower

ONLY a short time ago a concrete job using a tower and spouting equipment was a sight to attract the attention of the public as a curiosity and the builder or engineer looked upon it as a unique method to be thoroughly tested before receiving his full approval. The last two years have seen a remarkable development of this economical and flexible method of handling concrete and even the comparatively small job finds the tower and chute practical.

The one objection to its use is the tendency, in order to secure an easy flow, to use too much water, causing a dangerous separation of the concrete. This is a very real danger against which one must always be on guard. The flow of concrete depends not only on its fluidity secured by excess water, but also upon its plasticity, which is an entirely different property.

Plasticity depends upon several causes, the proper grading of materials and very thorough mixing being most important. Concrete holding only such an amount of water as will make separation impossible will flow if given extra mixing.

Plasticity, secured by thorough mixing, causes an easy flow of concrete, helps it to work easily and thoroughly into place and around reinforcing, and insures a greater density and strength than with less thorough mixing.

A small amount of hydrated lime in the mix aids greatly in securing the easy flow required and is a valuable ally in obtaining dense and waterproof concrete.—Concrete.

Why Office Buildings Vary So Widely in Profits to Their Owners*

By W. ROSS THOMPSON

AFTER having had sixteen years' actual experience, I feel justified in pointing out some of the requirements of a successful building manager. There are many points in the management of large sky-scrapers that are very little known or appreciated by the renting public. The requirements in order to successfully operate and manage an office building are many.

The manager should be both technical and practical, but in many cases theory and practice do not go together. He should be a man of good personality, good address, clean of habit, and a diplomat, because the class of office seekers who inhabit all office buildings differs in many ways.

The office building of today is practically the home of the business man, as at least 50 per cent. of his time is spent there, and it is up to the manager to make his surroundings as pleasant and comfortable as possible. This not only requires diplomacy, but it requires good judgment, as many of the requests and many of the requirements cost the owner a great deal of money, much of which can be saved by using tact. If all requests of tenants were granted almost any building manager of any great sky-scraper in New York City would put himself in wrong with his owners financially, as the expenditures would be enormous.

It is the chief duty of the building manager to operate and give high-grade service at the least possible expense. This should appeal not only to building owners, but to real estate men in general, as the operation of real estate and management of office buildings are often parallel.

The manager of a sky-scraper should be personally able to master every detail of mechanics that go to make up the equipment of his building. He cannot have good information as to renting and the requirements of the tenants, and not know the mechanical end, as the larger expenditures in building management run into the maintenance, repairs and management of the steam, electric and elevator plants. He should be a man capable of judging help—a very important feature—and know how to operate his building to the highest degree of efficiency with the least number of employees.

Dishonest Building Managers

Another very important requirement of an efficient office building manager is his ability to purchase supplies at the lowest rates obtainable in order to bring his building up to the highest point of efficiency with the lowest possible expense. There are many other requirements, but none more important than honesty. Seventy-five per cent. of the managers of office buildings in the City of New York are dishonest. In other words, they add to their legitimate income by taking graft on the supplies that they purchase. They purchase inferior grades of supplies at such high prices that they cannot keep the cost of operation down. For instance, oil. This is billed to the owner at 60 cents, and the difference between that price and the price that it should have been sold at goes to the office building manager as his commission in the shape of a rebate. I can personally cite my own case. I purchased packing for my engines and pumps from a certain packing concern in the City of New York, for twelve years. I paid fairly good prices for my packing, and at the expiration of twelve years I decided to make a change, being influenced by the sales-

*This article was written for the Real Estate Magazine by a man who has had many years of experience as an office building superintendent and manager. He is at the present time superintendent of the Marbridge building, New York.

man who served me during those years, as he had gone with another concern. Immediately upon my making the change the sales manager of the packing concern from which I had previously purchased called upon me and wanted to know why he had lost my orders. I said that it was simply because I believed that I had found a better packing for less money.

"Why," he said, "we have always paid you a commission," and I came very near putting him out of the office. In explanation he said Mr. So-and-So, the salesman, had an expense account that he carried, and on the total sales at the end of the year I was given a commission; that I was a man who would not take a check; that at the first of the year he had to give me so much cash. "Why," I said, "I never took a penny from him in my life, and it is very funny that you have not called my attention to this before. I say to you now that I want nothing to do with your concern. I have been honest all my life, and I don't think I will start the game at this time."

He was very much surprised. He said that it was usual to pay a commission, and when they found a man who would not take a commission they were tickled to death. I said, "In my case, there is the door. My office is open to inspection, and you are at liberty to go to my employer. If you can show where I ever took a penny of commission in all the years I bought packing from you, I will get out of this business." He said, "I see the thing now." I said "Why didn't you come back to me when I sent bad packing back to you?" He said, "The salesman fixed that up. He had a regular expense account, and in that little book in which he kept your name you were among the men who took a cash consideration at the end of the year."

That salesman made a salary of $20,000 a year in that way. I even told him that I didn't want him to send me any cigars for Christmas; that all I wanted was good goods.

Cost of Maintenance

One of the reasons that the cost of maintenance per square foot in office buildings in New York City is so great can be traced to the above conditions. There is another reason, and that is the expensive organization which is not necessary if the proper man is put in as the manager and head of the building. The operating engineer will go to the superintendent, who is not a mechanic, and he will make a requisition for a certain amount of supplies. He says, "Now, you get these from So-and-So. There is one place where you can get this stuff good, and that is what I must have in order to operate this engine." So he gets his packing from the fellow from whom he buys his supplies. The superintendent does not know the value of such goods, as he has not had the training. He calls up So-and-So and gives an order for eight feet of Tobin Bronze. Now, then, he goes to the supply man and says, "Send us ten feet of Tobin Bronze and ten feet of brass, as the brass is the cheaper, and charge it as Tobin Bronze." The difference in cost goes to the operating man.

One of the chief expenses is fuel. A well-managed office building will weigh its coal and ashes. We have meters to indicate the output. The ultimate end of the fuel is the heat supplied to generate steam power for making electricity. Coal will vary in B.t.u.'s, which is the greatest thermal unit, or the heat. Some coal is higher and some lower in this respect. It is up to the judgment of the building manager who has the engineering information to be able by tests made from time to time on his boilers to prove that the coal he buys is the most economical for his purpose. I figure that hard coal high in B.t.u.'s is the most efficient.

Storage Room an Economy

In the erection of an office building or sky-scraper, storage room or space for a large quantity of coal is often overlooked, which prevents the owner from getting the benefit of wholesale prices by buying in carload lots. Many office buildings are constructed with room for just two days' supply. This is a gross error on the part of the owner or builder, as it puts him at the mercy of inclement weather when the price of coal is liable to be raised on account of inability to deliver. We have storage room in this building for 500 tons. The building being operated on an average for the year of nine tons of coal per day. That means day and night service, and includes electric light, elevator service, and hot water.

It is a gross error on the part of an owner who contemplates erecting an office building or apartment house if he does not, at the beginning of the operation, secure a combination manager and engineer to superintend for him personally, regardless of the architect or builder, for a man of this kind will not only be able to save money for the owner, but will show him many, many details of unnecessary equipment installed in office buildings and apartment houses which have to be maintained at an added cost, and can be done away with, thereby saving these additions to the cost of construction and afterwards in maintenance.

Why Office Buildings Do Not Pay

There are very few buildings in New York City that are making more than 3½ per cent. on the investment. One of the reasons for this is the high cost of maintenance. A well-managed office building should not pay less than 10 per cent. to the owner; it should yield 15 per cent.

As the building increases in size the cost of maintenance per square foot should go down instead of up. The average cost of maintenance per square foot is 60 cents for big office buildings in New York City. It runs in some cases from 70 cents to 80 cents. The lowest is 35 cents. I cite for an instance this building, Marbridge, which cost no more to maintain in 1914 than it did in 1908, when we first opened it. The successful office building manager does not lose sight of the old adage that "A stitch in time saves nine." He does not wait until the pipe becomes so rusted that it bursts and does a lot of damage, but removes it and puts in a good pipe. He keeps all his equipment up to date. Another point of necessity is the judgment of the superintendent regarding the engineering end. He must so thoroughly understand the condition of the steam plant without having to call anyone in to tell him. A well constructed office building should run along for years at an even cost for maintenance. As the percentage of rentals increases the cost of maintenance should not increase at the same time, but profits on the owner's investment most certainly should.

Another point is that the so much talked of reduction in operation by public lighting plants which make propositions to the owners that they can light and heat their buildings cheaper than they can do it themselves, in my opinion, is all rot, because there must be something wrong with the management of buildings where this is possible, as I have proved that the difference between the cost of lighting and operating electric elevators from a public lighting system, and the cost of operation of my own isolated plant was $9,000 in a year, to say nothing of the absolute necessity of our having to have help to be able to maintain our electric machinery for the elevator service.

The Importance of Publicity for the Engineer

By C. E. DRAYER*

WHY should we engineers be interested in publicity? Is there good reason for departing from the time-honored precept that our achievements are sufficient witnesses to their creator's ability?

He who molds together brick and steel and stone, it matters not with what great cunning, will never rise in the estimation of those about him to a position above that of a skilled artisan. The engineer's mute witnesses of his ability are to the public mere piles of steel, long lines of railroads, or canals, or tunnels—just material things. The public must learn that we dream dreams and see visions long before a pound of material is shaped; that a part of our dreams is ever to subject the forces of nature so that man may develop the best that is in him, according to his destiny.

The man in the street is not likely to find this out unless we tell it to him in his own language. We have waited long enough for him to find it out unassisted, and our rewards bear evidence of the fruitlessness of our waiting. Unless we show that we are leaders we shall be only workers—hewers of wood and drawers of water.

There are other reasons for proper publicity conducted by engineers, all of which may be included in the broad purpose of service to the public. One of these is to correct error and misrepresentation, so that when questions of public policy come up they will be decided in accordance with correct engineering principles rather than by the whim of the moment, directed, perchance, by some small class to further selfish ends.

The country is burdened with wastefulness where engineering skill might save vast sums. For instance, it is planned to spend a hundred million dollars on highways in New York state without adequate provision for maintenance. It is hardly possible that such a proposition would have been seriously entertained if the public had waited for the opinion of the engineering profession before making a decision. Again: Recently a proposition to spend fifty million dollars on good roads in Ohio was voted upon without any preliminary studies or surveys as to how the money was to be spent. Had the proposition been approved, the money would have been largely wasted under the direction of jockeying politicians.

At present the Government is spending millions of dollars and requiring the owners to spend many more in making a physical valuation of the railroads. When two vacancies occurred in the Interstate Commerce Commission a year or so ago, the suggestion was made to one who had the ear of the appointive power that it would be desirable to have one of the vacancies filled by an engineer. He replied that such a position required a judicial quality of mind and that the incumbent could surround himself with all the expert service needed. His answer implied that an engineer could not be found possessing the necessary judicial quality of mind. It should be stated that the man who gave this reply was a lawyer.

There is a vast national field for furnishing engineering information to the public, which can be taken care of only by a permanent national information bureau conducted by engineers.

We have technical and research societies without number—so many that the public can hardly be blamed for believing that we are interested in material things only. Perhaps we need a national bureau to conduct and cultivate business relations with the public, including inter-society relations, publicity, employment, and legislation.

*From an address before the Engineering Section of the Chicago Association of Commerce.

All over the country there is a growing protest against the direction of municipal affairs by the lawyer and the politician. The administration of municipal business is largely a function of engineering. Why not enable the public to see this situation in its true light and thereby perform a public benefaction as well as advance our own interests? Positions for engineers would increase in number, and compensation likewise. In the matter of seeking to prevent harmful legislation, recent events in the State of Illinois are a sufficiently strong argument to convince Chicago engineers of the need.

* * *

The Architect and the Engineer in the Future

AT a recent meeting of the Philadelphia Chapter, Mr. John C. Trautwine, widely known as an eminent engineering authority, delivered an address upon the subject of the Architect and the Engineer. Opinions will no doubt differ greatly as to the position which Mr. Trautwine takes, and we believe that the picture of the architect secluded "behind his curtained office-entrance, under his picturesquely low ceiling, in rooms lighted by small-paned windows," will not suggest itself generally as a faithful description. But Mr. Trautwine offers a good deal of food for reflection, and some interesting ideas as to the future development of the process of socialization. He said, in part, as follows:

"Any estimate of the future relation between architects and engineers, or of the nature and extent of their future co-operation, must take into the account that prodigious and evolutionary progress in socialization, which, beginning with the advent of the steam engine, has been the distinguishing feature of our economic development during the last hundred years; a process which means the unification of mankind and thus the substitution of a natural and horizontal stratification in place of the numerous, artificial, vertical, and generally mischievous cleavage planes which still separate mankind into small and contending, if not inimical, groups.

"A century ago, each individual depended almost wholly upon himself (or upon other and almost equally inefficient individuals) for the supply of his very restricted wants. Today, governments, national, state and municipal, vie with giant private corporations for the privilege of transporting him (in small armies and over prescribed routes) and his goods from place to place, and they have thus brought the whole world to his door. Similar stupendous agencies provide him with water-supply, with street facilities, with clothing, with food and with fuel, all more or less under governmental control; they put him in instant communication with his fellowman at the world's end; daily, weekly, monthly, or "every little while," and, in volume hopelessly beyond his reading powers, they inform him as to the world's doings. The poorest dweller in a city is made the virtual owner of its street and park systems, and his city not only keeps these in repair for him, but provides him with free baths and free band concerts.

"And is the individual then left idle? On the contrary, he has been made an employee, and thus a part, of one or other of these very agencies.

"Now, owing to its nature, engineering, as a business, has gone farther in this direction of socialization than has architecture; for, in general, the engineer designs relatively *large* works, under the direction of large clients—governments and great industrial corporations, such as railroads, mining, and manufacturing companies,—whereas, in general, the architect serves rather the private individual or a relatively small group,—the builder of his own mansion, or a church, or bank corporation. Hence, a large proportion of engineers have

become salaried employees, either of governments or of large corporations, whereas one thinks of the employing architect as an individual or a small firm, with relatively few employees.

"As, in general, the lawyer continues in strictly private practice, while the conveyancer has been driven or drawn out from the dingy quarters which he occupied a half-century ago, and has been herded, with hundreds of others, in the employ of great title companies, so also the architect (still the director of his own fortune) secludes himself behind his curtained office-entrance, under his picturesquely low ceiling, in rooms lighted by small-paned windows, while his engineering brethren (having to handle larger work) form large corporations, employing hundreds of highly trained and specialized assistants.

"The not-distant future is bound to see the culmination of the socializing process. Possibly within the next generation or two, all the business of the civilized world will have become public business, and all its people will be parts and employees in the world industrial army. To the engineer this will bring a condition differing only in degree from that to which he is already accustomed; but the architect has still to undergo the socializing process in which the engineer seems to have been pushed farther.

"And, as the architect is thus driven out of the splendid isolation which now distinguishes him, he will see that the supposed barriers between him and the engineer are largely artificial and conventional, partaking of the nature of those other vertical cleavage planes, the intersecting frith and the mountain interposed, which (although now largely bridged and tunneled by the engineer) still, to some extent, "make enemies of nations that had else, like kindred drops, been mingled into one."

Stupendous as are the material benefits conferred by the socializing process in which we find ourselves, they sink into insignificance when compared with the accompanying moral blessings,—the end of hatred and suspicion and secretiveness and meanness; the end of the wasteful and unnecessary conflict of competition for private gain, and the substitution of co-operating and co-ordinated world-effort for the general good; the beginning of the study of the human being as a spiritual entity; the elevation of the human race from its present squalors and prejudices and ignorances: the advent of the superman; the opportunity, for the first time, to practice Christianity.

"In this coming millenium, in the breaking down of the vertical partitions which now seem to separate them, architect and engineer must perforce share, to the great benefit of both and of the entire community."

* * *

Styles of Fireplaces

IT goes without saying that the fireplace adds a charm to a home which makes it more cheerful and attractive. The number of fireplaces being installed is growing, and many new styles, with and without mantels, in beautiful designs, have been used with artistic effect, says a writer in the Brick and Clay Record. This is not only true of city homes, but builders of town, village and country homes, as well as hotels and churches, and other public builders, are making use of decorative fireplaces. The use of cement block in fireplace construction permits the erection of a design which fits in with the general scheme of the room. Any design may be modified to secure a maximum of decorative effect. For instance, a simple fireplace of plain construction would be a suitable one for an office; a large one, in keeping with the size of a rotunda, for a hotel; an inglenook, for a den and a variety of sitting rooms, dining rooms and parlors with pillar effects.

square mantel or arch construction built of plain or special faced molded units—block or brick.

Fireplaces built of cement brick are not of any particular size, but may be arranged to suit the room for which they are intended. The elasticity of this form of construction allows any size to be easily secured. An experienced workman can easily erect the fireplace. The addition of elaborate decorations does not add very much to the work of construction when brick is the material used. The workman must, of course, have a good knowledge of joints, since sometimes a narrow joint is desirable, and at other times a very heavy joint. The top of a fireplace may be varied to suit the ideas of the builder or the house owner. For instance, decorative top of cement bricks or small blocks may be used, or a wooden shelf, to harmonize with the rest of the fireplace construction. For a den, a bookcase constructed either at the side of or over the fireplace, or both, is often desirable and good. One of the chief objects for the builder to bear in mind in any of these arrangements is symmetry, for with a simple, appropriate, and symmetrical design in keeping with the surroundings, the fireplace becomes a harmonious, attractive and useful piece of house furnishing.

* * *

The Five Orders of Architects

THE following extracts from a musty volume of the eighteenth century on the duty of the architect, contained in a recent issue of the London Builder, may provoke a smile on the part of American readers:

"As there be five Orders of Architecture—namely, the Tuscan, Dorick, Ionick, Corinthian, and Composite, of which all elegant structures be composed or ornamented—so likewise are there five orders or different kinds of architects, each differing from one another, yet all of them are paid or recompensed in like manner by those requiring their services, and the payment is at the rate of five pounds per centum on the moneys expended on the erection of the structures devised by the architects.

"And the *First Order of Architects* is that called the Art Architect, who hath much conceit of his calling. He is oft-times dressed in curious fashion in a coat of velvet, and weareth a beauteous tie and a soft hat. His hair falleth over his forehead in curls and quaintly toucheth his collar. Those who employ him fear him, for he who crosseth his fancy he treateth as a felon or else sheddeth salt and bitter tears. His devices for buildings are oft-times exceeding quaint, and at times inconvenient to those who occupy the dwellings he deviseth. Yet is there thought and meaning abundant in all. He deviseth hearts upon doors and chimney-corners, the fires whereof oft-times smoke, yet their appearance is exceeding quaint and primitive. He quarrelleth with the decrees of the local surveyor, as no such an one existed in the time of the Heptarchy. The latches upon his doors one pulleth with a bootlace, and he thinketh of a pigeon-cot and sundial even in the forecourt of a city office. Thy garden space he filleth with clipped yews and lily ponds, and the pegs for thy washing will he design to teach thy maidservant culture.

"Now, the *Second Order of Architects* is that called Practical, and none would know them from stockbrokers by outward seeming. Unlike the architect of the first order, he of the second order buyeth thy chimney-pieces ready-made and knoweth where thy wife wanteth the draining-board of a sink that her maid may place unwashed crockery thereon without hurt. He falleth in readily with thy wishes, saying this is the whole duty of one of his calling. Yet mayhap thou wilt discover the dwellings he deviseth are exceeding common-

place and like to those raised by the builder without aid, and thou mayest find him more practical in word than in deed.

"The *Third Order of Architects* is the Competitive Architect, and the manner of his working is altogether different from that of the architect of the first and second order. For whereas these are chiefly concerned with the devising of dwellings, the Competitive Architect's brain is even like unto a seething caldron of mighty thoughts. He draweth out schemes for public buildings which are not straightway given unto him, but only if they have been matched against many others and adjudged better than they are. He burneth the midnight lamp, and sweat rolls down his forehead even on to the paper whereon he worketh. He is balanced in the scales of hope and of fear, and his excitements are many. For, as Holy Writ hath it, many are called but few chosen, and oft-times the architect of the third order cannot discharge the reckoning of his washerwoman. Yet fixeth he his eyes on the stars and his mind is filled with great thought. When he succeeds he oft-times watcheth princes lay the corner-stone of his buildings while many applaud, and his name waxeth great in the land.

"Now, the *Fourth Order of Architects* men call Speculative and very different is their method. For the first three orders have no thought of the wherewithal from which payment must come, but wait in their chambers for the knock of the client. But those of the fourth order see a fair piece of land and show those who desire money how by building therein they can make more. Yea, balance sheets are the weapons wherewith they fight, and they will even tell one where money can be had at interest if more can be made by borrowing thereof. As other men, some among them are good and others bad, who lead the unwary into pitfalls and grow fat with the five per centum on what has been expended. Yet the fourth order has its uses, nor may man condemn them without judgment.

"The *Fifth Order of Architects* is that called Official, and hath this difference from all others. For whereas the four orders we have mentioned live even upon five per centum or starve because it is lacking, the Official order is payed even by salary by public bodies who employ them continuously. So care sitteth not beside them, but neither does the hope of great rewards brighten their years. And have they the bitterness spoken of in Holy Writ of serving masters manifold, who are appointed not because of their knowledge of Art, but simply by the pleasure of the ratepayer. And they get them grey hairs and troubles attending many committee meetings, nor are those who serve many gratefully treated. And, as among the other orders, some are cunning and fashion great devices, while others have not the skill of the artist.

"And the aforesaid we have mentioned are the five Orders of Architects who use the five Orders of Architecture that the children of man may have habitations, for, since mankind must increase and multiply, so must they have buildings that their bodies be not destroyed by the rigour of the elements."

*
* *

Rapid Age

"Is that a genuine antique?"

"Yes," replied the dealer.

"Why, here's a mark that indicates it was made only twenty years ago."

"We are living in a very rapid age. It doesn't take nearly as long to make an antique as it used to."—Washington Star.

The Stability of Quay Walls on Earth Foundations

IN spite of the large amount of experience which has been gained in the construction of quay walls, it is still one of the most difficult problems in engineering to design a wall on an earth foundation with confidence that it will be stable when completed. A warehouse or a bridge can now be designed not only with the assurance that it will bear its load; but also with a knowledge of its factor of safety sufficiently accurate to satisfy the designer that material has not been wasted. But the same can certainly not be said of a retaining wall on a soft bottom—at all events not of a wall, say, 40 to 80 feet high, such as is commonly needed to sustain the quays of a modern dock. Even if the designer of such a wall is assured that it will stand, he cannot with any confidence tell you what factor of safety it possesses. The cause of his uncertainty is of course the difficulty of ascertaining the actual lateral pressure imposed by an earth backing and the actual resistance offered by an earth foundation. His difficulties are thus different from those of the engineer who has to design large masonry dams. The latter structure are invariably placed on a foundation of solid rock, and the designers' chief care is that the stresses in the masonry of which the dam is composed shall not exceed a safe limit. The dock engineer on the other hand has to be anxious that his wall shall not move as a whole on the comparatively soft material, on which such structures have in general to be placed. A retaining wall may fail as a whole in two ways:

(1) By sliding forward on its base, and

(2) By overturning.

It may be said at once that as regards quay walls, at least, the former mode of failure (by sliding forward) is by far the more common.

The conditions of stability in a "gravity" wall may be summarized thus:

The forces tending to thrust the wall outwards (generally the lateral pressure of the earth backing) must be at least equalled by the forces tending to restrain it or thrust it inwards. The latter forces are generally the pressure of the water under it in front of it, the resistance of the earth in front of its toe, and the horizontal resistance to shear (or the friction) at the base of the wall. If these horizontal forces balance, the wall cannot slide forward.

The resultant of the outward forces, however, is almost always at a higher level than the resultant of the inward forces. Thus a couple is formed tending to overturn the wall about its toe. This couple induces a counter-couple tending to keep it upright. The forces forming this counter-couple consist, on the one hand of the weight of the wall acting vertically downwards, together with the weight of any earth or water which may lie above the base of the wall, and on the other hand the upward resistance of the earth under that base.

If the upward resistance of the earth beneath the wall is capable of forming with the downward weights a couple at least equal to the overturning couple, the wall cannot overturn.

In order that the earth beneath the wall shall be capable of forming this righting couple, two things are necessary, writes Mr. F. E. Wentworth-Sheilds, member of the British Institute of Civil Engineers. It is obvious that the centre of the earth's resistance must be forward of the center of gravity of the wall and of other loads on the base, and generally it is forward also of the mid-point of the base of the wall. Consequently the intensity of upward resistance is generally greatest at the toe and least at the

heel. To preserve stability the resistance at the toe must not be greater than the maximum which the earth is capable of offering, and that at the heel must not be less than the pressure induced by the tendency of the earth to rise at this point.

Calculations for the stability of quay walls cannot in our present state be always relied upon and failures on the one hand and waste of material on the other, are liable to occur even to the most careful and experienced designer. This, however, is not saying that such calculations should be entirely ignored. On the contrary they are most useful in suggesting means for increasing in the most economical manner the stability of designs, which are known or suspected to be weak.

Among the devices which have been used for increasing the stability of quay walls, namely: (1) Admission of water into dock, (2) Sinking foundations deeper, (3) Building buttress walls in front on main wall, (4) Making wall wider, (5) Removing a portion of the backing, (6) Improving backing, (7) Sloping base of wall, (8) Driving piles under base, (9) Anchor ties, (10) Lengthening toe.

* * *

City Houses Should Combine Comfort, Charm and Beauty

MANY costly houses in our cities represent merely dull prose when truly they should be poems of comfort, charm, joy, individuality and beauty.

Architectural possibilities in the building of a city house or its remodelling are in many ways limited as compared with the country home. There are usually no grounds around it; neighborhood and environment must be accepted, in general, as beyond the individual's power to change—he cannot usually modify them as he can to a considerable degree in the country. But the problem, by being thus limited and concentrated, becomes, in a way, even more stimulating and more interesting.

In the treatment of both exterior and interior there are possibilities of beauty, charm, comfort, convenience, too often passed by unrealized. There is no valid reason for the lack of individuality characterizing most of the fine residences in our large cities. Many of them have fine sites, at the edges of parks, facing tree bordered public squares or fronting river or lake, that offer rare opportunity for harmonious treatment on broad lines of taste and effectiveness, says a writer in the New York World.

The three essential elements of a city house are convenience, comfort and beauty, united in finest adaptation of the individual house to the needs of the owner. Many houses overemphasize in mere appearance at the expense of convenience and comfort, but beauty can never be considered apart from use in its highest form in the home. Convenience means efficiency in the household, the reduction of labor, time, energy to its lowest terms, with maximum ease and simplicity in the working of the machinery of service. A perfect kitchen, well planned, well lighted, with every modern convenience for order and expeditious work is a valued aid in solving many of the problems of service. Liberal storerooms with broad shelves adapted to specific needs and electric lighted wardrobes with hanging appliances that treat dainty gowns and heavier clothing with proper respect and little closets tucked into just the proper places are a joy to the heart of woman. These and many other conveniences which architects often deem of secondary importance should be considered in the original designs of the building or in the remodelling.

Comfort is a three-fold problem of architecture, furnishing and decoration. Every room should be satisfying, as perfectly fulfilling its destiny, its complete harmony with the need it typifies. If too large or too small, there can be no real comfort; if the furnishings do not give the maximum of ease, making one quickly oblivious of them as means to end in the general spirit of satisfaction they bring to body and mind, there can be no real comfort; if the coloring of the decorations or the designs proves aggressive or stir some restless inner feeling of protest, or if certain articles of furniture cannot associate together in peace and harmony in the same room, there can be no real comfort. There are rooms that as we enter captivate us with their charm to which we involuntarily surrender; there are others far more elaborate, far more costly, that leave us cold, irritated or subtly disturbed. Behind every success or failure is its reason, and if we can only discover this reason we have the pass key to power.

The beauty of the house is fundamentally architectural; it is the charm of proportion, of size, arrangement, relation of the parts of the room to each other and the relation of each room to those adjoining and opening from it. A touch of individuality in the treatment of some detail may redeem a commonplace convention to a genuine delight to the senses. The decoration and furnishing are limited and to a degree rendered essential by what the architect has done. If this work has not had the full prevision of the general decoration and furnishing to follow, it cannot be a real success.

* * *

Architects in Charge of Construction*

By WALTER B. CHAMBERS, in The Brickbuilder.

THIS article is not intended to be anything more profound than a brief discussion of the trade-contract method of conducting building operations, and the presentation of a few points in its favor as compared with the usual "general contract" method.

Of the various ways to go about erecting a building, by far the commonest is to put the work into the hands of a "general contractor." It is usually awarded to him after he has been selected from among several competitors who submit their bids based on the architect's drawings and specifications.

The general contractor is a middle-man. He is rarely a mechanic or a direct employer of skilled labor. He takes the architect's drawings and specifications to his office and calls in his sub-contractors,—firms or individuals carrying on the various building trades,—whom he invites to submit to him their bids for that part of the work which is to be done under their particular trade. In this way he gets his bids for the carpentry, plastering, heating, plumbing, structural iron, ornamental ironwork, etc. To the sum of the most favorable bids he so obtains, and which represent the real cost to him of putting up the building, the general contractor adds his own profit, generally 10 per cent, and then offers the owner this sum as his bid for doing the work. If it compares favorably with estimates similarly made by other general contractors who have been asked to submit bids, the work is awarded to him.

Viewed from the owner's standpoint there are many disadvantages attaching to this way of building. That the owner's viewpoint is the right one for the architect is unquestioned, as he is the owner's agent in the transaction, and while it is his first duty to be fair in all his dealings and rulings, his legal position naturally causes him to look after the owner's interests with special care.

* In a future issue the advantages of the "General Contract" method will be discussed.—EDITOR.

An honest, competent and experienced man acting as the general contractor can be a very effective aid to a building enterprise; there are many such men in the business, and their employment is wise in many cases.

Architects who are more interested in the artistic than in the practical problems connected with their work will welcome the opportunities which the employment of an efficient general contractor affords them, of shifting responsibility to his shoulders. It is comforting and reassuring to feel that one's work is being well and promptly executed through the activities of your contractor—that your client's end of the contract is being honestly lived up to by the "party of the first part." But how many times is such confidence well placed? Builders are, as a rule, no more unselfish than most business men, and at best they are, and naturally so, a little more anxious about their own interest than anyone's else. It is clearly improper to leave in their hands any power to choose or direct or to exercise discretion of any importance. In other words, it is the architect's plain duty to look after his client's interests himself and not delegate any of that duty to the man who has the other end of his client's contract.

But many times the employment of a general contractor adds to, rather than lessens, the architect's difficulties in controlling and directing a building operation, by intervening between him and the sub-contractors. Being responsible legally only to the general contractor, the sub-contractor can evade carrying out instructions received directly from the architect by interposing his employer and claiming that all orders to him must pass through the latter. Technically he is perfectly right in this position; but when, as is often the case, it is made use of to thwart the carrying out of the architect's wishes, the latter looks about for some other system of legal relationships and responsibilities which will be a help to him instead of a hindrance. He can find this in the "trade-contract method."

By the trade-contract method the architect, acting for the owner, makes direct contracts with each of those manufacturers and employers in the different building trades who under the other method are only sub-contractors of the general contractor.

To do this properly, the drawings and specifications must be prepared in considerably greater detail, and a much larger number of copies of each are needed for sending out to the tradesmen to secure estimates; for it is necessary to take at least six estimates in each trade in order to get the benefit of the competition, which is one of the chief purposes of the procedure.

There are two signal advantages of this contract-by-trades method,—first, the *more direct control* over the work which it gives to the architect, and second, the reduction in cost, through the greater amount of competitive bidding by the many would-be contractors, and through the elimination of the general contractor's profits.

The importance of the first of these cannot be too greatly emphasized, for it deals with those matters which make the difference between satisfied and dissatisfied clients, successful or unsuccessful operations. For that reason it is even more important than the second, since efficiency and energy in carrying out a building are even more to be desired, in most cases, than rock-bottom prices. Still, there is no surer way to obtain for a client one hundred cents' value for every dollar expended, than by contract-by-trades procedure.

Another advantage is that inspection and superintendence of work in progress, both at the shops and at the building, is made easier for the architect. Under the ordinary system when the architect or his representative visits the sub-contractor's shops and thinks it necessary to order changes or corrections, he finds his directions accepted by the sub-contractors "subject to the approval

of the general contractor." The reason is obvious,—the sub-contractor, being responsible legally only to the general contractor, doesn't propose to let himself be committed to any modification of his contract without the latter's sanction. This puts the architect in an awkward position. It is as though the colonel of a regiment was told by the lieutenant to whom he had given an order, "I'll carry it out if my captain approves."

The military analogy, though not perhaps a true one, will do to illustrate the awkward state of affairs,—a state of affairs which can't exist under the trade-contract system, where each tradesman has his legal relations direct with the owner.

How many trade-contracts are needed in a building operation? This depends both upon the nature and the location of the building. An office building in a large city requires over fifty;—a city residence a little more than half that number.

The greater the number the greater the advantage to the owner, and also the greater the complications and difficulties in management and direction on the part of the architect. Too much sub-dividing is apt to defeat its own object. Following is a fairly typical list of convenient trade-divisions into which the erection of an ordinary city building may be separated:—

1. Demolition of existing structures.
2. Excavation, shoring, etc.
3. Masonry.
4. Waterproofing.
5. Bluestone.
6. Limestone and marble.
7. Granite.
8. Fireproof construction.
9. Structural iron.
10. Iron, other than structural.
11. Sheet metal work and roofing.
12. Metal furring and lathing.
13. Plastering.
14. Carpentry.
15. Joinery and cabinet work.
16. Plumbing.
17. Heating.
18. Electric work.
19. Interior marble and slate.
20. Tiling.
21. Concrete paving.
22. Elevator plant.
23. Painting.
24. Glazing.
25. Hardware.
26. Lighting fixtures.
27. Special finish and equipments.

* * *

A Monster Cannon Ball of Granite

A century ago the Turks had the largest cannon in Europe. They actually used a gun that fired a shot weighing 800 pounds. When Sir J. Duckworth, the British commander, passed the Dardanelles to attack Constantinople in 1807, his fleet was dreadfully shattered by the immense shot thrown from the batteries. The Royal George, of 110 guns, was nearly sunk by only one shot, while another cut the mainmast of the Windsor Castle almost in two. A single shot knocked two ports of the Thunderer into one. The Repulse (74 guns) had her wheel shot away and twenty-four men killed and wounded by a shot, the ship being saved only by the most wonderful exertions. The heaviest shot which struck the British ships was of a granite, weighing 800 pounds, and was twenty-six inches in diameter. One such shot, to the astonishment of the tars, stove in the whole starboard bow of the Active; and, having crushed this immense mass of timber, the shot rolled ponderously aft, the crew standing aghast at this singular spectacle. One of these big guns was cast in brass. It was composed of two parts, its breach resting against massive stonework, and the difficulty of charging such a monster would not allow of its being fired more than once.

Building Construction and the War

Much has been told of the fearful destruction of property in the war zone. Current illustrations show the devastation caused by artillery and other agencies of war on the fine old buildings of Belgium and northern France.

The thought suggested by these pictures is not so much wonder at the destruction as at the fact that damage is not far greater.

Imagine the results of bombardment and invasions on American cities. In the war zone in many cases where a town was deliberately destroyed the individual buildings had to be fired. There was not enough exposed inflammable material to spread the fire even where it was encouraged rather than fought.

Without expecting that the terror of war will reach this land, it is easy to foresee the fate under bombardment of our cities with our fire-fighting forces out of commission.

There is at hand the best structural material ever given to man for his use. There are efficient means of using it. The one great hindrance is lack of knowledge. This applies to owner, architect, builder and workman—Concrete

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PAUL C. BUTTE - *Electrical Construction*
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CHARLES W. FORTUNE - { *Heating and Ventilating*

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August G. Headman — F. D. Hudson
Alfred F. Rosenheim — Sumner P. Hunt
G. Albert Lansburgh — Norman F. Marsh
Houghton Sawyer — Smith O'Brien
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Arthur Brown, Jr. — Harrison Albright
Chas. P. Weeks — John Parkinson
Octavius Morgan — A. W. Smith
J. C. Austin — William H. Weeks
John J. Donovan — Chas. W Dickey
W. H. Ratcliff, Jr. — Henry C. Smith

CONTRIBUTORS

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Wm. A. Newman — W. Garden Mitchell
Jas W. Plachek — Nathaniel Blaisdell
Wm. C. Hayes — W. R. B. Wilcox
Chas. Henry Cheney — William Mooser
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A NEW JAPANESE INVASION

The wily Jap is scoring in the building game and all because of the apparent shortsightedness of some of our planing mill owners, carpenters and cabinet workers. Some time ago leading lumber concerns, such as Dieckmann Hardwood Co., White Brothers, Niehaus & Co., and others, became interested in Japanese oak, buying it in the log and sawing and seasoning it in San Francisco, thus making the development of this trade a home industry. Japanese oak was found to be satisfactory for certain purposes and became quite the vogue for a time both for interior trim and for furniture. When the local firms had developed this trade the Japanese shippers sought to increase their profits by doing all manufacturing in Japan, shipping the boards here and selling same direct to the consumers, thus cutting out the lumber mills that had developed the business. There might have been some attractiveness in this change if a large saving had been effected to the consumer, but not so, for despite the fact that the labor of sawing and handling in Japan costs but a small fraction of a dollar per day per man as against from $2.50 to $6.00 per day on the Pacific Coast of the United States, the Japs absorb practically all this extra profit for themselves, as they make but a trifling reduction, which is offered as an inducement for using the Japanese made and sold Japanese oak instead of the old, reliable Eastern oak.

The question arises, will the Japanese merchants stop where they now are, distributing their lumber to wood working establishments such as planing mills, furniture factories, cabinet makers, bank and store fixture manufacturers, flooring mills, etc., or will they go a step further and do all that work themselves in Japan by Japanese labor and cut out the American manufacturers by selling their finished product—flooring, millwork, furniture, fixtures—direct to the consumer. They can very easily do it. They have the cheap labor in practically unlimited quantities and with the assistance of

their government, are developing all avenues of industry whereby they can give work to their own people. This is a matter of grave concern to all coast labor and one which should be brought to the attention of labor leaders, "home industry" workers, etc.

THE RESPONSIBILITY FOR INSPECTION

With periodical regularity we hear of a failure or near failure of a building, and with it more or less censure of the architect. The public seemingly fails to appreciate the fact that the architect, in many cases, especially in these days of stress when the owner wants to keep down the expense, merely prepares the plans and has nothing whatever to do with the construction work.

It is getting to be altogether too common a practice for a client to pay his architect two, three, and in exceptional cases, four per cent for turning out a set of plans and then, being possessed of the drawings, the owner does with them as he sees fit. He may let out the work or he may build by day labor. Sometimes he employs a competent superintendent but more often he leaves it to the contractor and if the latter is not very competent and conscientious, there is likely to be trouble with that building. It would, therefore, seem to be economy in the end for an owner to pay an architect 6 or even 10 per cent and know that the building is to be put up right. The architect assumes the responsibility when he is paid his full fee. He takes no responsibility in so far as construction is concerned, when the owner hires him simply to draw up a set of plans and specifications. Courts have ruled that inasmuch as the architect or engineer made the plans, if the building fails, the architect or engineer must be held responsible, for the failure must have resulted from an inferior or faulty design. But this is hardly a fair ruling, since the design might be ever so good, yet without competent superintendence it could be made a botch.

ARIZONA NEEDS SOME DRASTIC LEGISLATION

The Architect and Engineer enjoyed a visit last month from Mr. J. E. Kennedy, an architect of Flagstaff, Arizona. Mr. Kennedy is preparing a bill for the next legislature which, we trust, the state Solons will have the good sense to pass. The bill will provide for a Supervising Architect of State work, the appointment to be made by the Governor and the term of office to be four years. The incumbent will act as adviser and it will be his duty to invite reliable architects to compete for state work. The bill will further provide for a State Board of Examiners who will issue certificates to applicants who demonstrate their ability to practice the profession. At the present time any person who can draw a straight line has about as good a chance of getting a commission as an experienced architect.

Besides the urgent need of these bills, the state of Arizona is in a bad way in the matter of handling its construction work. The contract system has been abolished and now all state work is done by day labor. In other words, an uncertificated architect may step in, design a state building, and without competition buy the materials and sublet the work to whom he chooses.

Here is the flowery Utopian argument presented by the State Federation of Labor which pulled the law through by the slender majority of 901 votes, some 15,853 out of 32,607 voting against the measure:

> We are now passing through a crisis in the industrial affairs of this nation that is becoming appalling. City after city and state after state are being torn asunder with strife and civil war. Red hate holds sway. The people of the nation are coming to realize that we have arrived at a stage where it is necessary to either take over some of their industries or else allow the Rockefellers, Morgans, Guggenheims and Clarks to continue to rule the people as peons or serfs in federal baronies.
>
> Arizona being a new state with its resources hardly scratched as yet, we should take some steps now to conserve the state's resources in line with the law that gives the work to citizens on an eight-hour basis at good pay, rather than a state full of peons where their product is sent out to New York, Boston, London or Paris for a few millionaires to revel in luxury.

May, 1914 Copy Wanted

Will pay 50c for a copy of the May, 1914, Architect & Engineer.

With the Architects and Engineers

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$20,000 City Residence

Geo. A. Applegarth, architect of San Francisco, has made preliminary plans for a handsome city residence to be erected on the southwest corner of Washington and Locust streets, San Francisco, for Mr. John A. Buck, Jr. It will be in the Italian Renaissance style and will cost in the neighborhood of $20,000.

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Sacramento Library Competition

The Sacramento city commission has authorized a competition for a $100,000 Carnegie library and the program has had the approval of the San Francisco Chapter, A. I. A. Quite a number of architects have enrolled—close to fifty—and some splendid drawings may be expected. The successful architect will receive a fee of 6 per cent of the total cost of the building. There will be no other prizes. The competition ends November 1st and judgment will be rendered not later than the 15th. The jury will be composed of the Sacramento city librarian, one member of the city commission and an architect who is a non-resident of the city of Sacramento, to be named by the Institute Chapter. Mr. Edgar A. Mathews will probably represent the Chapter on the jury.

Partnership Formed

L. M. Turton and W. F. Herbert have formed a co-partnership for the practice of architecture in Santa Rosa. They have opened offices in the Santa Rosa Bank building and will be glad to receive trade literature, catalogues, etc. Mr. Turton has been practicing architecture in Napa for a number of years, and he will continue to have an office there as well as in Santa Rosa. Mr. Turton was the architect of the Santa Rosa hospital. Mr. Herbert is a graduate of the Boston Technical school.

The new firm has considerable work now under way, including two residences to be built in Santa Rosa, one for Mr. G. A. Proctor to cost $7000 and one for Dr. Johnston.

Crocker Highlands Residence

One of the finest sites in the Crocker Highlands district of Oakland has been purchased by Mr. J. E. Higgins, Jr., who intends to build a splendid home at once.

Stockton Savings Bank

C. W. Dickey, Central Bank building, Oakland, is completing working drawings for a bank and store building to be erected in Stockton for the Stockton Savings Bank. It has been decided to make the building Class "A," with steel frame, concrete walls, and terra cotta exterior. The classic columns will probably be of Travertine marble. The building will occupy ground space 50x100 feet. Besides quarters for the bank there will be two stores, one on Main street and one on Sutter street. There will be a mezzanine floor on which will be the directors' room, lockers and toilets and storage rooms. The counter screens in the main banking rooms will be entirely of marble and glass. The floor and wainscoting of this room also will be of marble. Vault doors will be round and will be built of crome steel. Ceiling of the main banking room will be ornamental stucco. The building will be equipped with a steam heating plant and possibly a ventilating system consisting of a fan and blower. There will also be a vacuum cleaning plant.

Maybeck Writes About Fine Arts Palace

That which most keenly impresses the majority of visitors to the San Francisco Exposition is the romantic Palace of Fine Arts, which has been said to be the most divinely beautiful building ever reared in America. Unusual interest is therefore attached to the announcement by Paul Elder & Company, San Francisco, that they will soon publish a little volume written by the architect, Bernard R. Maybeck, of Berkeley, in which he discusses in a naive and simple manner the Fine Arts Palace and Lagoon, not from the physical but rather from the psychological point of view with reference to the effects of architectural forms on the mind and feelings, and analyzes the various elements which influenced the composition of the architecture and landscape.

Visalia Auditorium Competition

A competition for plans for a municipal auditorium for the city of Visalia has resulted as follows:

First prize—Plans adopted carrying 5 per cent of the contract price of the building, awarded to Messrs. Coates and Traver of Fresno.

Second prize—$250, awarded to M. L. Weaver of Visalia.

Third prize—$150, awarded to Messrs. Glass and Butler of Fresno.

Fourth prize—Honorable mention and possible money, awarded to Messrs. Schwartz and Schwartz of Fresno.

The fourth award was made in view of a possible inability to secure a bid within the money available on the first set of plans, those of Coates and Traver of Fresno, in which case Mr. Weaver would have first place, and Messrs. Schwartz and Schwartz would come to third place. The first prize winners, however, have declared that their immense building covering almost an entire half block can be constructed for the money at hand, $35,000.

Convention of the American Institute of Architects

A meeting of the American Institute of Architects was held on Friday, October 8th in the Italian room of the St. Francis Hotel. There were present members from all the Coast chapters and a number of the Eastern ones, besides architectural draftsmen and students of architecture.

President R. Clipston Sturgis, and the officials of the institute who accompanied him from the east explained the aims of the institute in its relation to the profession of architecture and what it is endeavoring to accomplish.

At 3:30 p. m. of Monday, October 11—which the officials of the Panama-Pacific International Exposition set aside as Architects' Day—President Charles C. Moore presented to the president of the American Institute of Architects a commemorative scroll in recognition of the architectural profession and its part in making the Exposition a success. The presentation took place in the Court of the Universe.

Columbarium at Mount Olivet Cemetery

In the September Architect and Engineer two half-tone plates were shown of a columbarium designed by William H. Crim, Jr., architect of San Francisco. The caption beneath these cuts read "Columbarium at Cypress Lawn Cemetery," when it should have read "Columbarium and Incinerary at Mount Olivet Cemetery." The building is now practically finished and has been pronounced one of the largest and most up-to-date on the Coast.

San Francisco Municipal Work

The erection of the steel frame of the Public Library building in the San Francisco civic center has been completed by the U. S. Steel Products Company.

The steel frame of the Juvenile Detention Home on West Mission street is being put up, the foundation work having been finished. This building which will cost the city about $150,000, will probably be completed in seven months.

Messrs. Ward & Blohme are preparing plans for two new fire department houses, one to be built on Mint avenue and the other on Howard street, near Third. They will cost $40,000 and $30,000, respectively.

Adopts Code of Ethics

Southern California chapter has adopted the code of ethics of the American Institute of Architects. Members of the chapter were under the impression that the code had been adopted until recently when a search of the records disclosed that while the code had been discussed it had not been adopted by the chapter.

At the last meeting announcement was made that the board of freeholders which is now framing a new city charter for Los Angeles, had agreed to incorporate a clause providing for the creation of a city planning commission.

No Wonder Business Is Slack

"We lost a $25,000 apartment house the other day," said the senior member of a San Francisco firm of architects that endeavors to live up to the ethics of the profession and " holds out" for the Institute 6 per cent. And then he added in a tone of disgust:

"A competitor took the job for $175. He furnished the owner with a complete set of working drawings and specifications for the $175; then left it to the owner to let the contracts and put up the building."

C. W. McCall Has Much Work

Charles W. McCall, the Oakland architect, has been exceptionally busy the past couple of months. He has completed plans for apartment houses for Robert W. Farmer on East Twenty-fourth street, Edgar L. Ormsby at Forty-first and Terrace streets, Oakland, and residences for Nat M. Crossley, James Tyson and J. J. McDonald. All three houses will cost approximately $6,000 each.

Portland's Schools

Louis S. Stone of Stone & Wright, the Stockton architects, recently returned from a trip through the Northwest. Mr. Stone was impressed with the splendid schools that recently have been erected in the city of Portland, but he was greatly disappointed in the poorly constructed school houses in the country districts.

Postoffice Buildings

As previously stated in this magazine, a new plan has been adopted by Secretary McAdoo for classification of postoffice buildings. The regulation will be according to postal receipts and will be as follows:

Class A—Marble or granite facing; fireproof throughout, metal frames, sashes and doors; interior finish to include the finer grades of marble, ornamental bronze work, mahogany, etc.; public spaces to have monumental treatment; mural decorations; special interior lighting fixtures.

Class B—Limestone or sandstone facing; fireproof throughout; exterior frames and sash, metal; interior frames sash and doors, wood; interior finish to exclude the more expensive woods and marbles; ornamental metal to be used only where iron is suitable; restricted ornament in public spaces.

Class C—Brick facing with stone or terra cotta trimmings; fireproof floors; non-fireproof roof, frames, sashes and doors, wood; interior finish to exclude the more expensive woods and marbles, the latter used only where sanitary conditions demand; public spaces restricted to very simple forms of ornament.

Class D—Brick facing; little stone or terra cotta used; only first floor fireproof; stock sash, frames, doors, etc., where advisable; ordinary class of building.

Personal

W. S. Hebbard, architect, of San Diego, has been appointed by the mayor to serve as one of the civil service commissioners of San Diego.

Harrison Albright, architect of Los Angeles, is erecting a fine residence on his ranch in Spring Valley in San Diego county.

Myron Hunt, architect of Los Angeles, recently enjoyed a trip to San Francisco and the Panama-Pacific Exposition.

Lyman Farwell has removed his architectural office to larger quarters in suite 615, W. P. Story building, Los Angeles.

General Geo. W. Goethals, builder of the Panama canal, was a recent visitor to the Exposition. While in San Francisco he was entertained informally by different clubs and societies. In Los Angeles General Goethals was a guest of the Jonathan Club.

Among the visitors to San Francisco the past month was Professor Larch of the Department of Architecture, University of Michigan. Professor Larch attended the Engineering Congress, spent considerable time enjoying the Exposition, and paid a visit to the office of the Architect and Engineer.

Architect to Build

W. C. Pennell, 1304 Baker-Detwiler building, Los Angeles, has prepared plans and will build for himself a two-story, eleven-room English style residence on Buckingham drive, in Lafayette square.

Furniture Warehouse Alterations

C. E. Gottschalk, who succeeded to the business of the late William Curlett in San Francisco, has recently completed plans for extensive alterations to the Wisconsin Furniture warehouse at Fifteenth and Commercial streets, San Francisco, and also a one-story brick store building to be erected in San Anselmo for E. I. Crane. Mr. Gottschalk has made preliminary sketches for a large Oakland building.

Addition to Sisters' Building

Messrs. Welch and Carey, San Francisco architects, have made plans for a substantial addition to a three-story building at Haight and Laguna streets for the Sisters of the Holy Soul, also a residence in Claremont court and a store building on Fillmore street for the Shean Estate.

Carnegie Library

Messrs. Ward and Blohme, San Francisco architects, have made preliminary plans for an $8000 reinforced concrete Carnegie library to be built at Lakeport. The same architects are making working drawings for two fire houses for the city of San Francisco, one to cost $40,000 and the other $30,000.

Municipal Waterworks Building

Edmund J. Burke, architect of Eureka, has been commissioned to prepare plans for a steel and concrete building for the municipal waterworks of Eureka, Cal. It will cost $10,000.

Phoenix, Arizona, Building

Sidney Mashbir has been commissioned to prepare plans for a two-story and basement brick building to be erected on West Congress street for the Spanish-American Alliance. The first floor will be divided into two stores and the second floor will be arranged for lodge purposes.

Brick Church for Santa Monica

Norman F. Marsh, 214 Broadway Central building, Los Angeles, has prepared plans for a new church to be built at Santa Monica for the First Baptist congregation of that city and it is expected that work will be started within a short time.

Los Angeles Residence

Otto Neher, 709 Garland building, Los Angeles, has purchased a site with about 300 feet frontage at Third and New Hampshire streets and will erect for himself a large residence. Mr. Neher will probably build a two-story frame and plaster house containing about twelve rooms.

San Jose Garage

William Binder, Rea building, San Jose, has completed plans for a one-story reinforced concrete commercial garage, at First and San Carlos streets, San Jose, for John Twohy. Building will be 58×162 feet and the contract price is about $10,000.

Arizona Needs Some Reform Legislation

Editor The Architect and Engineer:—At the general election in November, 1914, the people of the state of Arizona passed an initiative measure that abolished the contract system on all state work. Namely, flumes, dams, reservoirs and buildings, and that provides that such work shall be done by "day's pay." In drafting this law, no provision was made for the appointment of a person to represent the state and to carry out and look after the state's interest and welfare.

At the present time the award of plans on all state buildings used for public instruction, such as normal schools, lies wholly in the hands of the board of education of the different districts. This board has power to award contracts for plans with professional advice, thus using their own judgment.

In nine cases out of ten, this judgment is insufficient to provide for the best set of drawings being accepted, as the drawings that look best on paper might in all due course be the ones that should not be accepted, as we of the profession well know that a pretty drawing is captivating to the layman, while in reality it would be impossible to produce, in actual construction, the building typified on the drawings, because of several elements, namely, cost, materials and the impracticability of the design and construction called for. For illustration: In June of this year the board of education, of the Northern Arizona Normal school, awarded the contract for plans for a new dormitory at Flagstaff, the architectural scheme of the building being pure Colonial; the already existing buildings of the group being of a design in absolute clash with the contemplated building; further, it will be impossible to erect this structure for the amount appropriated.

When these working drawings were completed, the board, acting in ignorance of the law, advertised for sealed bids. On the day that the bids were to be opened the attorney-general of the state advised the board of the law abolishing the contract system, thus holding up the projected work.

The designer had already received his compensation on a percentage basis which, according to the law, should have been by "day's pay."

In closing, let me say that the practice of architecture in Arizona is under no restrictions, and anyone, whether capable or not, can "hang out his shingle," there being no examining board or license required.

Competitions are awarded and carried out with programs prepared by the board, leaving many loop-holes for irregularities, as they are prepared without expert advice, and according to no fixed or standard practice. They allow only a small compensation to the designer, this being too small to attract men of ability.

J. E. KENNEDY.

Flagstaff, Arizona.

Progress of University Work

Plans for two new buildings for the campus and for the completion of the Doe library are being prepared by John Galen Howard, the supervising architect of the University of California. These improvements, when completed, will cost $1,000,000, which, with the $800,000 appropriated for the construction of Wheeler hall, will exhaust the $1,800,000 bonds voted at the last State election.

A second unit of the agricultural building group, costing approximately $350,000, will be erected north and west of Agricultural hall.

On the site of the historic "chem" pond a new $250,000 chemistry building will be constructed of the same architectural design as the other new buildings in the Greater University plans.

Architects Enjoy Luncheon

The architects of Los Angeles were recently guests of honor at the monthly luncheon of the Metropolitan Exhibitors' Association, in the large room adjoining the exhibit. Between twenty and twenty-five architects were present. President Thomas Fellows presided at the informal conference following the excellent luncheon. Talks serious and jovial were made by a number of the architects and the exhibitors.

Kings County Highway Construction

Kings county highway construction under the good roads bond issue, was started Sept. 7 when Chairman J. M. McClellan of the board of supervisors turned the first earth with the shovel used twenty-four years ago to turn the first earth for the excavation for the existing courthouse. The breaking of ground for the highway system, for which $675,000 bond money is available, was made the occasion for a celebration.

MacLaren to Beautify Parks

Donald MacLaren of San Francisco, landscape architect, has been engaged by Redlands to work out plans for beautifying the city parks and streets. Mr. MacLaren's first work will be done on the parks and he is now preparing plans and specifications for this feature of his plan.

They All Make Mistakes

Now and then we have been criticised for a typographical error or incorrect caption. But no publication is infallible—not even the American Institute Journal, which recently published an obituary of the late William Robert Ware who died June 10, 1915, and erroniously reported Mr. Ware as having died in 1910.

Institute Architects Plan Changes in Membership

Final draft of the revised constitution and by laws of the American Institute of Architects which is to be submitted to the Institute convention to be held at Washington, D C., Dec 1, 2 and 3, have been received by members of the Pacific coast chapters. Many important changes affecting membership are proposed.

Three classes of membership are established

An active class to be known as members, an associated class and an honorary class

"Any resident of the U S who is a practicing architect, or an architect engaged in professional education, or an architectural draughtsman over thirty years of age, is eligible to membership if able to submit the required proofs of his or her professional capacity and honorable personal and professional standing."

No application shall be considered if one or more members out of every ten object and two negative votes shall reject when final ballot is taken by the board of directors A rejected candidate cannot again apply within a year Members shall be designated by the initials "M. A. I. A." Fellowship will be conferred on members as heretofore for notable professional achievements, the elections to be made at annual conventions by Australian ballot from a list to be recommended by the board of directors. Fellowship shall be designated by the initials "F. A. I. A."

Associates shall be elected by members of the Institute who are members of the chapter within whose territory proposed associates have their business headquarters. They may use the designation "Assoc. A. I. A." All chapter members not members of the Institute shall become associates automatically on the adoption of the new by-laws. This section will cease to be a part of the by-laws three years after adoption.

The new by-laws abolish the Chapter-at-large and require all members to affiliate with chapters in whose territory they have business headquarters All the territory within the U. S. is to be divided among the several chapters In each state where two or more chapters exist a state board may be formed, the president and secretary of each chapter to be members ex officio of such board. Each chapter may furnish additional members to the number of delegates the chapter was privileged to send to the preceding annual convention Chapter members shall be either Members or Fellows of the Institute or Associates of the Institute.

Chapters may affiliate themselves with allied organizations or organizations of professional juniors within their territory with a view to furthering the profession and its allied arts and the purposes of the Institute

Country Residence Work

Messrs Hodges and Mitchell, San Francisco architects, have let a contract for a frame and stucco residence to be erected at Atherton for Dr Sharpe Plans have been finished and bids taken for a country house at Palo Alto for Mr J M Moore It will cost about $5000

Another Cafeteria for San Francisco

San Francisco is to have another cafeteria from plans by a Los Angeles architect —Arthur S. Heineman. It will be at 945 Market street, where Long's market used to be About $30,000 will be expended in fitting up one of the most attractive restaurants on the Coast

Praise for Municipal Auditorium

"Never have I seen anything like it," declared James B. Reynolds, secretary of the Republican National Committee, after a thorough inspection of the San Francisco Municipal Civic Auditorium. He was under the escort of officers of the San Francisco Convention League, who have charge of the campaign to win the Republican national convention of 1916 for San Francisco.

Reynolds was visibly impressed with the great structure, every part of which was visited and studied with relation to its possible use as the place of meeting for the national convention. Details as to all of the conveniences for committee meetings and for every other activity of a great political assemblage were pointed out Secretary Felton Taylor of the League showed Reynolds the seating arrangements of the main auditorium, where 11,000 persons can be comfortably seated, and where as high as 17,000 people have found places.

Besides this, it was shown that all of the accessories in the building were adapted to supply just the needs of a vast and busy throng In mind's eye was pictured the seating of the delegates, and for Reynolds' benefit the space estimated to be required for the working forces of the convention were laid off

"Why, you could put the Coliseum of Chicago inside this edifice," was one comment, "and still have room to spare."

New Bridges for Santa Barbara County

Santa Barbara county has voted favorably on a $350,000 bond issue for building bridges along the state highway The character and location of the proposed structures are as follows:

1 One bridge at the crossing over Southern Pacific railroad track

2 A reinforced concrete girder bridge over Eagle Canyon creek

3. A steel-truss bridge over Dos Pueblos creek.

4 A reinforced concrete bridge over Gato canyon.

5 A reinforced concrete bridge over El Capitan creek.

6. A reinforced concrete bridge over Corral Canyon creek.

7. A reinforced concrete bridge over Tajiguas Canyon creek.

8 A reinforced concrete bridge over Arroyo Quemada.

9. Two steel-truss bridges over Gaviota creek between Gaviota Gorge and the Pacific ocean.

10. A steel-truss bridge in Gaviota Gorge over Gaviota creek where state highway crosses creek

11. A reinforced concrete bridge over Las Cruces creek at place known as Sheep Camp.

12 Four bridges across Nojoqui Creek at point where state highway crosses creek in Cuesta canyon.

13. A bridge across Santa Ynez river at the point where state highway crosses river near mouth of Zaca creek, the cost to said county to construct and build said bridge not to exceed $50,000, the cost in excess of said sum to be paid by the state of California.

14 Six reinforced concrete girder bridges over Zaca creek between Santa Ynez river and Zaca station.

15 Three reinforced concrete girder bridges between Zaca station and Los Alamos

The Importance of Complete Electrical Specifications

Electricity is the only widely used commodity that has decreased in price during the last decade. With the reduction have come great improvements in the design of all electrical products and large increases in the uses and applications of electricity.

The changes have been so rapid that even a specialist has difficulty in keeping up to date. Due to these changes the importance of complete practical electric wiring specifications as a means of correcting some adverse conditions cannot be overestimated.

Unless electrical specifications are complete and rigid it is a difficult matter to select the most favorable bid—as price is the only basis considered.

Reliable contractors using only good material and doing excellent work, frequently lose a contract from this cause, then the extra work, misunderstandings and exceeded appropriations amount to much more than the thought and time necessary to make them complete.

Owners of all types of buildings realize often too late that insufficient provision was made for necessary electrical conveniences; statistics show twenty-five per cent additional to original contract price expended before building is occupied and fifty per cent additional after building is occupied. Much of this could be eliminated with a lower ultimate cost to the owner if the electrical specifications were complete and the appropriation for electrical work increased sufficiently to compensate for the advances made in this branch of the industry. Less than three per cent increase over present building costs will be enough as an average.

The co-operation of all architects, builders, owners, manufacturers and contractors is necessary and this condition is rapidly materializing with beneficial results to all.

To cite an instance of this co-operation the General Electric Company maintains a building equipment department and specialists in all their local offices for the purpose of giving personal attention, gratis, to requests for complete, special or standard electrical specifications covering any specific building project.

An Evil that Should Be Stamped Out

From the San Francisco General Contractors' Association Review

A member of this association recently paid a deposit of $5 for a set of plans for a bridge in Contra Costa county.

On having made up his estimate the contractor then returned the plans and asked for the return of his $5 deposit. He was told that this was a charge for figuring the work and to pay for the plans.

Deciding that an office that would resort to such practices would not be of a desirable kind under which to carry out the terms and conditions of a contract, the contractor decided not to bid. After the bids were opened it developed that he would have been the low man.

Such tactics as this have been pursued in several other cases during the last six months and the practice is one which should be stamped out. This association on behalf of its stockholders has previously dealt with several such cases and each time was able to insist on the deposit money being returned and from present indications this matter will have to be publicly dealt with and the practice absolutely stamped out.

Advancement in Plumbing Trade

For some time it has been conceded that the plumbing business is undergoing radical changes. Times are not what they were; new conditions suggest different methods. The live business man is the one who keeps his ear to the ground and is ever ready to march abreast of the times. Evolution, like time, waits for no man. Just as life must adjust itself to changing environment, so must commerce and industry fall in line, or succumb to the inevitable. In the laboratory of nature the processes of progress and decay are ever active; one or the other is the destiny of all things. Nothing can remain stationary—not even the plumbing business.

That the science of plumbing—and a fine art as well—has moved forward goes without saying. It is only necessary to compare present-day workmanship and apparatus with that of but a few years ago to allay any doubts along this line. Indeed, possibly nothing save electrical development can compare in any degree with the marked advance of sanitary plumbing. Without doubt these two avenues of human activity lead in the industrial world.—The Plumbers' Trade Journal.

Architects for Alameda Schools

Wm. Knowles, Hearst building, San Francisco, has been appointed supervising architect of school work, including new buildings and repairs to old buildings, in the city of Alameda. The architects who have been commissioned to design the four new school buildings are Cunningham & Politeo, Henry H. Meyers, Carl Werner and Chas. E. Rogers, all residents of Alameda, but in business in San Francisco. The city of Alameda has about $250,000 available for school improvements.

State University Library

John G. Howard is completing the working drawings for an addition to the Doe library at the University of California, Berkeley. Work is expected to cost $400,000. Two more stories and an attic will be added. Construction will be Class "A," with steel frame and stone exterior. The money is already available, having been bequeathed to the University by the late Charles F. Doe.

LAUREL LOGS IN YARDS OF NATIONAL MILL AND LUMBER COMPANY, SAN FRANCISCO

Laurel, the California Hardwood

By C. H. White.

ALL up and down the coast of California and Oregon are found beautiful groves of an evergreen tree distinguished at once from all others in its range by the strong camphoric-pungent odor of its crushed leaves or green bark. In moist shaded mountain canyons and gulches it appears in shrubby form but in the river bottoms and in the dense forests among other species of trees it has a clean straight trunk from 30 to 40 feet high and a narrow crown of close small, upright branches. The tree is a long lived one. Trees 20 inches to 25 inches in diameter are from 160 to 210 years old and larger trees are known which should prove to be much older. One tree has been sawed up in the San Francisco market which was figured out to be 500 years old. Laurel wood is very heavy when green, moderately heavy when dry, hard, very firm, fine-grained, and in color a rich yellowish-brown, often beautifully mottled. No other of our hardwoods excels it in beautiful grain when finished.

Laurel was formerly used to a very great extent in California, in fact, it was one of the best known and most highly prized hardwoods for cabinet work, shipbuilding, wagon work and hundreds of other uses. The great consumption of this wood 15 to 30 years ago depleted the available forests rapidly and with the lack of railroad facilities which prevailed at that time in the best laurel region, that is, Humboldt county, California, the production became too expensive in comparison with other hardwoods such as oak and ironbark and consequently laurel was in time almost forgotten. The activity of the railroads, notably the piercing by the Northwestern Pacific Railroad of the mountainous region between San Francisco and Eureka, has rendered accessible the finest stands of California laurel and in consequence this once popular hardwood has again come into its own, and a plenteous and stable supply is available at a very low price as compared with the Eastern and imported hardwoods. Large stocks of this wood are carried in San Francisco as will be seen by the picture of the immense log pile at the National Mill & Lumber Company's plant at Fourth and Berry Streets, San Francisco, belonging to White Bros., the Pioneer hardwood house. A perusal of the stock lists issued by the San Francisco hardwood dealers will disclose an enormous stock of sawn and seasoned lumber for which the demand is becoming greater every day.

California laurel has many merits. The U. S. Forestry Bureau tests show it to

occupy a position in strength, toughness and hardness midway between the oaks and the ironbarks. One of its principal points of excellence is the fact that subjected to friction it wears smooth and does not splinter.

Its beauty is well known. Many of the magnificent old pieces of furniture made of California laurel and still extant, attest the lasting quality of its handsome grain. At the Panama Pacific International Exposition the myrtle or laurel furniture in the Oregon building has attracted great attention as has also the beautiful set of carved laurel furniture, presented by Mrs. Phoebe A. Hearst, in the reception hall at the California building. Old timers in San Francisco will remember the cafe on the corner of Kearny and Bush streets below the old California Theatre, known as the Laurel Palace. This was finished in California laurel and the beautiful bar, panels and wainscot excited a great deal of admiration. The place was a landmark up to the time of the fire in 1906. The old billiard table manufacturers, Jacob Strahle and August Jungblut, made their finest billiard tables of laurel and in the show rooms of the last named is still to be seen an old laurel billiard table kept as a relic and to show the cabinet work of 40 years ago.

In shipbuilding, in repairing in drydock, and, in fact, in all marine work, California laurel is being used at the present time to a very great extent. The United States Navy Yards on the Pacific Coast have adopted California laurel as the standard wood for keel blocks in their dry docks. Mare Island and Bremerton both use considerable quantities of this wood for these purposes. In boatbuilding laurel is used for shaft or sleeve logs, fenders, rails, deadwood and many other purposes. In harbor work it is employed for chafing strips, pile fenders, rails, truss blocks in the sheds, and for planking on the bridges. The truss blocks in the municipal wharves at San Pedro are of laurel and the Third street bridge in San Francisco as well as the Webster street bridge across the estuary between Oakland and Alameda are both planked with laurel. The wearing quality of laurel on a roadway is about four times that of the white cedar or pine which heretofore have been used for the purpose.

Laurel has proven itself the best wood obtainable for oil well rigs. Made into bull and calf wheel shafts, cap blocks, and other parts of the rig which require hardwood, it gives a service unequalled. The blacksmith and wagonmaker find it a hardwood peculiarly suited to their purposes.

Lumbering is one of California's greatest industries. The state has long been famed for its magnificent redwood, sugar pine, and other softwoods, and now laurel is bringing it to the front as a producer of hardwoods.

Contractor Gets His Forfeit Money

On the advice of Prosecuting Attorney Murphy the county commissioners at Seattle were obliged to reverse themselves in their rejection of the claim for a return of $3500 forfeit money to Todd, Coates & Co.

Todd, Coates & Co. bid $35,888 for the construction of the Bellevue Samammish road. The county engineer's estimate was $47,000. After the Todd-Coates bid was accepted, the contractors represented that a mistake of $10,300 had been made in computing the cost of the gravel surfacing. The board refused to return the $3,500 forfeit money. The prosecuting attorney advised that under an honest error a contractor could not be held to his bid.

Upon the return of the money the contract was awarded at $49,998 to the next lowest bidder.

* * *

Cleveland (Ohio).—When bids were opened for the construction of the Brooklyn-Brighton bridge it was found that T. P. McCourt of Akron, was low at $438,811—more than $100,000 less than the three other bidders. After the bids had been tabulated, Mr. McCourt, in a letter addressed to the board of county commissioners, which was authorized to let contracts, stated that an error had been made in his bid in that an item which he intended to allow for removal of plant and for contingencies upon the labor situation had been omitted, and he therefore requested that his bid be not considered.

An examination of Mr. McCourt's bid indicated an error of judgment rather than a clerical error. It was recognized that he could not possibly construct the bridge at that price and because of the mistake in judgment the commissioners were reluctant to keep his certified security check of $10,000.

However, the instructions to bidders and the information on the proposal sheet relative to the retaining of the certified check clearly covered the situation. It was also realized that the building of the bridge was a public undertaking, with the conditions clearly stipulated on the blank ,which thus formed a part of the contract. When appealed to, the county solicitor, in a written opinion, held that the board could do only one of two things—reject all bids or award the contract to the lowest bidder, reawarding the contract and retaining the surety if after ten days he failed to undertake the contract.

It was evidently adjudged best not to follow the first of these courses, for the second plan was adopted. The unfortunate low bidder aided matters by waiving his right to wait ten days before signing the contract and at once authorized the commissioners to enter into the contract with the next ibdder.

State, County and Municipal Engineering

Good Roads—Water—Sewers
—Bridges—Fire Protection

Concrete Dam Equal in Height to 15-Story Building

If the concrete in the Arrowrock dam, the highest in the world, located 20 miles above Boise, Idaho, and which was completed October 4 last, were placed in the average block in most any city in the United States, it would stand flush with the four streets around it, as high as a 15-story edifice; if it were put into a column 10 feet square, it would stand 29 miles high. It is said that no bigger job of concrete mixing for one structure was ever attempted before in this country. Today this dam stands completed, a tribute to the Reclamation Service and engineering and constructing ability of F. E. Weymouth, supervising engineer of the Idaho district; Charles H. Paul, construction engineer and James Munn, superintendent of construction.

If this masterpiece in concrete could be weighed it would tip the beam at over a million tons. It is wedged and anchored in arch shape with a radius of curvation at 662 feet, 1100 feet long between sheer mountains towering a mile high. Its total height is 348.5 feet, 91 feet of which is below the Boise river bed across which it has been constructed. It rests on a base 240 feet wide which represents its thickness where it is concreted to granite. At the top it is 16 feet wide, crested with a concrete roadway guarded on either side by a parapet wall four feet high crowning which are are light pedestals the entire sweep of the curve. The sides are also anchored to granite cliffs. Inside of it are spacious inspection galleries running its full length at various levels, the lowest 230 feet below normal high water surface. In these galleries is the mechanism that operates the 20 outlets controlling the impounded water.

One side of this mighty dam contains a concrete deck over which logs floated down the reservoir can be snaked across and shot into a concrete chute, through a tunnel and dropped 60 feet into the river below. There are three billion feet of merchantable timber valued at thirty-six million dollars tributary to this reservoir and it is estimated it will take fifty years to float and shoot it over the dam. On the opposite side is a concrete coated spillway cut out of solid granite to take care of waters in the flood season.

Turning constantly, mixing and kneading their two-ten charge of concrete, double cone mixers churned for four years to mix enough concrete to fill the excavation for the dam and raise it to its present towering height. A total of seven hundred thousand cubic yards of rock and dirt was excavated for both dam and spillway and six hundred cubic yards of concrete were dumped into the dam. Where it was possible great boulders were used in the construction. A mountain side of gravel was moved, screened and dumped into gravel trains and carried 13 miles to the mixers. These dumped with the regularity of a clock. Electric cars then rushed the concrete into a tunnel to the distributing tower. Cableway buckets sailed through the air between the tower and hopper. It was then distributed from the hopper by chute to various points on the dam. In less than three minutes from the time gravel left its bin at the mixing plant, it was in its final resting place in the concrete of the dam. Every day saw the dam 2000 cubic yards nearer completion.

A sand cement plant with a capacity of 1000 barrels per day of 24 hours or a total output of 585,240 barrels saved the government thousands of dollars. Crushed granite run through this plant and ground with Portland cement, was mixed 45 per cent sand from the granite and 55 per cent Portland cement, giving a better and stronger mixture than pure cement. The mill was erected below the dam. Granite from the spillway excavation was passed to it through a chute, run through a rock crusher and sand rolls, dryer and ball mill and pulverized to pass a 20-mesh sieve. Mixed later with Portland cement it passed through a 200-mesh. Afterwards it was stored in large covered bins and as needed was blown by air pressure through a tube across the excavation to the mixers. All sand cement passed a thorough test before used. The plant is now being dismantled.

Before the foundation was laid, holes were drilled 30 to 40 feet into the granite bed and grouted with pure cement under air pressure to fill all possible crevices. These

holes were carried up into the dam together with seepage test holes into the inspection galleries where grouting machines can be set up and grouting resumed if water is found to seep through. If seepage develops the water will be carried off through the galleries.

The dam was started four years ago and completed over a year ahead of time at a saving under the estimates of $2,500,000. Total cost was $5,000,000.

What Quality of Aggregate Gives the Best Wearing Concrete Road?

The interrelation of size, shape, surface texture, hardness, toughness and crushing strength of the aggregate determines the wearing quality of a concrete road. This is the lesson indicated by the series of wearing tests on concrete recently conducted at the University of Minnesota and summarized in another column. Incidentally it deserves to be noted that these tests are the first laboratory tests to have been devised which afford either much information or means for successfully obtaining information except by observation of results of road wear in the field.

Hardness and toughness have been generally assumed to be primary requisites in an aggregate for road concrete. They probably are so but only when the factor of size of aggregate is duly considered. A well balanced fine aggregate of hard and tough rock wears well. A coarse aggregate of the same rock does not wear well. The reason for inferiority in the second instance is that the softer mortar matrix wears faster than the embedded stone and the protruding stones spall down and kick out. If in addition the hard stones are seamy the breaking down is more rapid. If also the surfaces of the stones are rounded and smooth, reducing bond, they kick out of their sockets more easily. Considering then tough and hard aggregates these conclusions seem justified: (1) The aggregate to wear well must be fine and well graded; (2) broken stone is superior to gravel because its better bond with the mortar matrix reduces the chances of kicking out of the particles.

Turning now to the soft stone aggregates, that is aggregates of stone no harder than is the mortar matrix, the tests indicate that wear is even. The stone wear as fast as the mortar and the pavement remains smooth. The factor of size of aggregate or of uniform grading largely disappears. If the soft stone is less hard than the mortar matrix and particularly if this stone is friable or flaky it wears faster than the matrix which is exposed in knobs and fins which rapidly break down. The same physical condition of surface is produced as existed with the hard aggregate and softer matrix.

The more nearly that road concrete approaches to being a homogeneous material the better it wears. With aggregate much harder than the mortar homogeneity is approached only by using a fine graded stone. If commercial sizes are used a sound stone no harder than the mortar is superior to a much harder and tougher stone. These conclusions follow from the tests which we describe but it is to be kept in mind that the tests are not great enough in number to have established definite conclusions on all points.—Engineering and Contracting.

Railroads Cut Rates on Structural Steel

The following are the old and new rates between California and the East on structural iron and steel and tin plate, shortly to be effective on the trans-continental roads, and announced by the Southern Pacific Company:

	O. R. Cents	N. R. Cents
Iron, steel, structural, etc.	75	55
Bar iron	75	55
Billets, blooms, etc.	65	55
Bolts, nuts, washers, etc.	75	55
Nails, spikes, etc.	75	55
Pipe, cast iron, etc.	65	55
Pipe, wrought iron	65	55
Plate and sheet, No. 16 and heavier, including boiler heads and ends	75	55
Sheet No. 12 and lighter	75	55
Single bands, box straps, etc.	75	65
Shoes, horse, mule and ox	75	55
Tin plate	70	55

Minimum weight to get carload rate for wrought iron or steel pipe reduced from 80,000 to 60,000 pounds.

Pacific Coast Steel Plant Enlarges

The business of the Pacific Coast Steel Co. has increased so largely that extensive additions have been made necessary in both the South San Francisco and the Seattle plants. It has added to its South San Francisco plant a new nine-inch mill, which materially increases the capacity for small sizes of steel bars from quarter-inch upwards, thus relieving the ten-inch mill. This last mill has been changed to the Belgian type of mill, splitting roughing and finishing rolls into separate trains. Speed is thus added to the finishing rolls and it may be said that this mill is now the fastest of its kind in the United States.

These changes have increased the finished steel product 25 per cent. Other important changes are contemplated. In addition to the increased local demand, large orders which absorb fully one-half of the output of steel have been received from foreign ports.

In line with this advancement and to meet the demand in the Northwest a 40-ton open hearth furnace has been added to the Seattle plant—also a 22-inch Three High Blooming mill. Additional offices have been taken in the Rialto Building, San Francisco, to accommodate an increased clerical force, and altogether the Pacific Coast Steel Co. would seem to be entering upon an era of great prosperity.

EXHIBIT OF "ARMCO" PRODUCTS IN THE PALACE OF MINES AND METALLURGY, P. P. I. E.

Pure Iron Exhibit in Palace of Mines

ONE of the triumphs of modern science is the attainment of an understanding of rust. Twenty years ago nobody knew anything definite of its real nature. Since that time the rust problem has been subjected to the deepest study by men having at their command all the resources of modern science. These investigators have included some of the most famous metallurgists of America and Europe. The result is, that today we know the causes of rapid corrosion and have at hand the means of preventing it.

A long and careful investigation of the durable irons of earlier times has shown that these were nearly always of high purity. Manganese and sulphur in particular were almost wholly eliminated. The modern rapidly rusting sheet metal has, on the other hand, a comparatively high content of these substances as well as of carbon.

These studies and experiments finally led to the discovery that the laws which govern iron and steel corrosion are the same as those of the electric battery and all electro-chemical action. Any substance other than iron and steel corrosion are the same as metal, may form with the iron a voltaic couple similar to that formed by the two metals of the battery. The activity of such a battery involves the destruction of one of its elements. Thus the principal cause of rusting is the presence of impurities. These, in the presence of moisture, set up the electro-chemical action which corrodes away the iron.

The qualities that made the iron of our ancestors far and away more durable than modern galvanized iron and steel, produce exactly the same results today. These qualities are purity and that physical evenness which comes from intelligent and painstaking methods of manufacture.

Armco (American Ingot) Iron has been developed along these lines. It has purity, evenness, and density in a very high degree and is proportionately rust-resistant and capable of long service.

Nearly all of the visitors to the Palace of Mines and Metallurgy find it well worth while to spend time in the booth devoted to the display of rust-resistant iron products. These include corrugated culverts in replica installations under highways and railroads. An Armco flume demonstrates its usefulness in connection with irrigation and power developments. Both culverts and flumes are carrying water as in service. A miniature Armco farm is a striking presentation of the varied service which pure and durable iron may perform for the agriculturist. Roofing and siding, fences, silos, tanks, roofs, etc., are displayed exactly as in actual use. Another portion of the exhibit is devoted to Armco building products of every description. Still another displays Armco stoves and refrigerators, and various handsome enameled articles made on an Armco base.

The practical uses of a highly rust-resistant iron are numberless. The display at the Armco booth, while highly varied, is only an indication of the possibilities in this direction. The tendency of the present time is toward more excellent and durable materials and away from the cheap and temporary. The visitor at the Armco booth will find the display illustrative of this distinctly modern and wholly admirable development.

Machine Mixed Stucco

The California Mineral Products Company, of which Mr. Holloway, well-known as the former manager of the Livermore Fire Brick Company, is a leading spirit, is about to place on the market a stucco plaster for exterior walls that will undoubtedly have a big demand. As is well known, it is an extremely difficult matter to mix concrete or plaster by hand and have them entirely satisfactory. One needs only to look around at stucco plaster finish on walls to see that at least 90 per cent of the work is streaked. Light and dark spots appear and there is neither uniformity of strength nor color. The stucco plaster sold by the California Mineral Products Company is prepared at the works in East Oakland, and is shipped in bags to the scene of building operations. The cost of the prepared plaster is no more than the cost of the raw materials when one takes into account the expense of laborers to mix the materials at the house. The company is making two grades of the prepared stucco as follows:

No. 1 finish coat plaster is compounded with white Portland cement and a snow white silica sand, which no other dealer on the Coast has ever used. It is waterproof in density and smooth as silk.

No. 2 scratch coat plaster is compounded with local Portland cement and two sizes of washed, sharp sand, free from any impurity or organic matter.

Packed in 100-lb. bags for immediate delivery.

Another product that bids fair to become popular with the architects and which the company will shortly put on the market, is an imperishable pressed facing brick made of cement. It is said that there is nothing on the market equal to this brick for beauty, uniformity and durability. They are made in various colors such as buff, cream, red, and white. They are put through very high compression and are said to be as substantial, if not more so, as clay brick. They make a particularly attractive facing for fireplaces and chimneys. Samples from stock on hand will be furnished by parcel post on request.

The works of the California Mineral Products Company are at 806 Forty-seventh avenue, East Oakland.

Coast Branch Established

The American Rolling Mill Company, manufacturers of Armco American ingot iron, is now represented in San Francisco with a direct factory branch. Messrs. E. A. Emerson and H. O. Stevens are in charge and they have opened offices in the Monadnock building.

It is the intention of the company to carry in San Francisco a complete stock of Armco ingot iron roofing, pipe, gutter, terne plate and metal lath. This means that there will be no delay in deliveries and when architects specify the Armco products they can be reasonably sure that there will be no substituting of inferior articles on the ground that goods cannot be readily obtained. It is not generally known that Armco iron is used for the cornice and skylight work on the new San Francisco city hall, as well as all sheet metal work on the $1,000,000 municipal auditorium in Oakland. Robert Dalziel, Jr., who had the sheet metal contract on the Oakland auditorium, in a letter to the American Rolling Mill Company, wrote as follows:

Gentlemen: We have just completed the sheet metal work on the million-dollar Municipal Auditorium building for the city of Oakland; this work required the use of two carloads of sheet metal, all of which was Armco iron from your firm.

This iron was shipped to us through the Panama Canal and came through in first-class shape.

I wish to state that the workmen who installed this iron say that it is the easiest to work that they had ever handled, and I know for a fact that we did not have a sheet crack on us by bending. I take pleasure in recommending the Armco iron as a first-class article and the best that can be made. Yours very truly,

ROBERT DALZIEL, JR.

Fine Contract for A. Knowles

A. Knowles, the well known San Francisco plastering contractor, has been awarded the contract for plastering and metal lath work on the First National Bank building, Portland. This structure will cost close to a half million dollars and Mr. Knowles contract alone figures $30,000 or thereabouts. Mr. Knowles has done some very creditable plaster work in San Francisco and the hay cities and the Portland job will probably be no exception to the rule.

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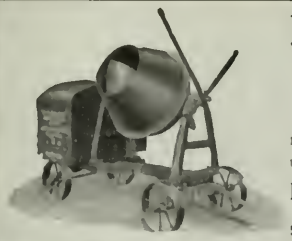

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Capacity 35 Cu. Yds. a Day

All rounded surfaces—no corners for concrete to lodge in.
Revolves on ball thrust bearing, hermetically sealed to prevent grit from working in.
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A Little Handbook

By F. W. FITZPATRICK

A LITTLE handbook has just come to my desk that, it seems to me, the Coast architects ought to greatly appreciate. To put it tritely it certainly "fills a long felt want." It is published by the Pacific Building Materials Company and is called the "Building Material Handbook." This San Franciscan company is made up of as enterprising, energetic and enthusiastic an aggregation of fellows as there can be found in that most enterprising, energetic and enthusiastic district, or any other district, for that matter.

The book is a ready reference, a dictionary, a text book, a sort of Bible for the architect or builder. If you want paint, therein will you find out all about paint, how it is made, how much surface various kinds of it will cover, how it is shipped, how to use it, and how much it costs. So with roofing paper, lath, Keene cement—anything and everything about a building. And all in concise form. You don't have to chase through your files for each specialty's literature or dig through tons of musty tomes of Sweet or Bitter indexes, but you find it all right there in a coat pocket-sized book.

You know, of course, that the inference conveyed is that anything you want in the building line will be found at 523 Market street, or if it isn't there the Pacific Building Materials Company will get it for you in a jiffy, but the advertisement is not flamboyant, aggressive, nor marring, for it is perfectly evident also that the company realizes that its best hold on you is through the service it gives you, and this little book is all service. All in your interest and all for your convenience. No Coast architect can afford to be without that handbook, and I wish to heaven the "supply" people of other districts would wake up and give us something on the same order, or at least as near that perfection as they can achieve.

Why He Didn't Secure Contracts

An Eastern contractor, after bidding on about a dozen jobs this season without landing a contract, began to look around for the reason for his continued ill-luck. He finally, half jestingly, ascribed it to his cost-keeping system. He has a very excellent system and has accumulated a large amount of valuable data. He consequently has a definite idea of what it will cost him to do certain work. He has used this knowledge in preparing his estimates and there has been no guess work in his bids. On several jobs he lost out by a narrow margin; but on others the contracts went at prices that indicated the low bidders had no conception of the cost of the work. The Eastern contractor, thanks to his experience and cost-keeping system, had a pretty good idea of what the work could be done for at a reasonable profit; the other fellows didn't, and as a result they now have something to worry about—Engineering and Contracting.

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Giving the Touch of Beauty to Cement

By A. M. MacMURRAY

IT WAS recognized almost at the beginning of the great development of the American cement industry, that cement for building purposes would be a leading, if not the leading, material. Its superiority, its strength, durability and economy had been proved, and it was to be expected that a way would be found to overcome its few disadvantages.

Chief of these was the tendency of cement and concrete to absorb moisture. Second was the dull monotony of color of ordinary cement, and the difficulty of making several batches of cement of like shade. Occasionally, too, ordinary cement takes on a spotted or streaked appearance, especially after protracted rains and snows.

Because of its character and its adaptability to almost any kind of construction, cement has often been the logical material to use, but its dull, blue-gray color so detracted from the artistic effect desired that it was much less employed than it otherwise would have been.

Ten or twelve years ago the use of cement was greatly retarded by these objections, held not only by architects and builders, but also by those for whom buildings were to be erected.

But the very objections to cement were an incentive to finding the means of overcoming them. Obviously, the remedy was to discover how to preserve cement and concrete from external influences by an appropriate coating, yet one which would have no deteriorating effect upon the cement itself.

It is essential in any cement coating that it contain no elements of a corroding nature. It is equally desirable that it dry on the walls without destroying the texture of the material.

In the case of a wash or cold water paint, which has been tried in many cases, the effect has been a coating as absorbent as concrete, or even more so. After a storm, the blotches and discolorations are still visible. Another point about a wash or cold water paint is that the glue or casein binder soon rots under the action of the alkali and dampness, and dusts or washes off.

Mixing colored pigments with the cement itself has not proved generally satisfactory. In some cases the addition of foreign coloring matter weakens the concrete. There also arises the impossibility of obtaining uniformity of color.

Lead and oil paints are out of the question. This is so for the reason that any coating which retains oil after drying is quickly acted upon by the alkali in the cement, forming a soapy mixture which never dries hard. Nothing containing neutralizing agents is usable to much advantage.

All of these facts have been recognized by the leading paint manufacturers of the country. It is generally accepted that the only medium is one which does not contain an oil affected by alkali, and one which evaporates at once as soon as applied. This leaves the base of the coating an integral part of the surface;

it preserves the distinctive texture of the cement because it settles in the pores.

In the manufacture of Bay State Brick and Cement Coating, Wadsworth, Howland & Co., Inc., 139-141 Federal street, Boston, have a coating which has been proved by the most practical tests to be ideal. Leading architects and contractors throughout the country have tried it and pronounced it entirely satisfactory, and this is having a marked influence upon the popularity of cement and concrete for homes as well as office buildings.

This coating is manufactured from a base of a concrete nature, does not turn yellow and admits of many pleasing tints. It has opened an unlimited field of artistic possibilities to the architect, contractor and owner.

In hundreds of cases the superiority of this coating has been proved by the fact that neither rain nor snow can penetrate the cement walls. Consequently there is no discoloration and the natural dampness of the cement is reduced to a minimum. Moreover, the early tests, made as long ago as a dozen or fifteen years, have established the durability of Bay State Coating.

Architects and builders here and there still adhere to antiquated methods, or continue to experiment in the treatment of cement, but hundreds of architects and contractors in all parts of the country have tested Bay State Coating and endorse it as the most practical means of overcoming the objections to cements, concrete and stucco.

One of the most interesting pieces of evidence which the manufacturers of Bay State Coating submit to architects and builders is the comparative photograph showing a concrete or stucco building before it has been coated and afterward. This is only one of the many interesting photographs reproduced in the new catalog which Wadsworth, Howland & Co., Inc., have published and will be glad to send to those interested.

It is surprising to note that in all sections of the country there has been a remarkable increase in the use of concrete and stucco for buildings of all descriptions. This is especially true, for some reasons, in the case of many prosperous and successful men who are seeking for homes picturesque and beautiful and for which cement outranks all other materials.

The western states have contributed largely to the increased use of concrete, not only in the residence class of construction, but in large office buildings and factories as well. Bay State brick and cement coating has been extensively used throughout this section, where its many excellent qualities are widely known.

A $1,000,000 Esplanade Proposed for San Francisco

An esplanade development to cost about $1,000,000 is proposed by the city of San Francisco. As outlined, the improvements will extend along the ocean beach from the Cliff House southerly.

Plans have been completed by M. M. O'Shaughnessy, city engineer, for the first section, for which an initial appropriation of $50,000 has been made. It is thought that 1,000 feet can be constructed with this sum and when completed its necessity and usefulness will be so appreciated that the forthcoming appropriations will be larger in amount and an earlier completion of the entire project can be had.

The plans provide for a concrete sea wall to be sunk into the sand 11 feet below low tide and which will be carried up on a slope 29 feet long on a very flat angle to an elevation 15 feet above the highest tide. At this point there will be a promenade 25 feet wide. To the top of the wall the surface will be concave. At intervals of 100 feet there will be landings 12 feet wide with easy steps extending down to the beach and between the landings the slope of the wall will be stepped to form resting places.

The boulevard proper back of the 25-foot balustraded walk will be 350 feet wide, with foot paths for horseback riding and a smooth-paved surface for all kinds of vehicular traffic.

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Points to Be Considered in the Efficient Burning of Petroleum

By A. H. LIGHT, M. E.

1. An ample supply of air
2. An atomization of the fuel to the finest possible state of division.
3. A most effective admission of the air

THE air admission to this finely divided fuel should be such as to produce a most thorough mixture The greater the ability of the furnace to mix the entering air with the fuel the more thorough and quickly developed will the combustion be.

A quick combustion means a short, clear flame and no smoke, resulting in the entire combustion being completed before the heating surfaces are reached by the evolved gases.

A slow combustion such as to fill the entire furnace with flame is simply caused by a corresponding slowness in the coming together of the individual atoms of fuel with the atoms of oxygen, supplied by the entering air Such slowness means a long flame and results in the combustion being carried on to the heating surfaces of the boiler either in or around the tubes, and the result is smoke, due to the consequent cooling of the gases.

One of the first effects of heat on the finely divided atoms of fuel is to separate the carbon, of which our petroleum contains approximately from 86 to 87 per cent., from the hydrogen content of same. The carbon is carried along in the current of gases and if its opportunity of finding oxygen with which it is desirous of uniting is poor, it is deposited on the heating surfaces as soot. Contact with the said surfaces reduced its temperature to a point below that at which it is possible for a combination (combustion) being affected, and it may be carried along in the currents of excess air which meet it too late and show up at the funnel or stack as smoke.

Smoke, when once formed, is very difficult to burn and the aim should be to make furnace such a thorough mixer of the elements which it is desirous of combining therein as to prevent its formation at all.

Careful study must be given to the proper admission of air to the fuel, as it is the most important point (considering the fuel as being properly atomized) in the proper burning of petroleum.

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University Starts to Build $615,000 Teaching Hospital

It is not only a new hospital but a new kind of hospital the University of California is building in San Francisco from gifts of $615,000 by various donors.

Most hospitals merely do repair work for dilapidated people. This new University hospital is not to earn one cent for anybody, but is to be dedicated to discovering how to keep people from getting out of repair, and how to sew the stitch in time that saves nine. The difference between this and most other hospitals, the University points out, is the difference between the farmer who merely smears tar where rodents have nibbled the bark and the farmer who does not stop with that but discovers the best ways to poison or suffocate the rabbits or gophers that did the damage.

Prevention or improved treatment of all the great classes of malady will be provided for in this new teaching hospital. Of the 215 beds, one-fourth will be for surgery, where progress nowadays is marvelous; one-fourth for medical cases; one-fourth for diseases of women and for confinement cases; and one-fourth for little children, for development of the modern methods by which children who, a generation ago, would have died or have become cripples or lifelong invalids, are made whole and sound for long and useful lives. Thus the medical students will receive training in all the chief fields of medicine.

Here are some of the great gifts to American hospitals during the past five years:

To the New Haven hospital (used by the Yale Medical School), $1,500,000.

To the Burke Convalescent hospital at White Plains, N. Y., $5,000,000.

To the Peter Bent Brigham hospital in Boston, one of the teaching hospitals of the Harvard Medical school, $7,000,000.

To the Presbyterian hospital in New York, used by the College of Physicians and Surgeons of Columbia University, $8,500,000.

Recently a man who had been twenty years a resident of California bequeathed over half a million for a hospital in Bennington, Vermont.

No American medical school is obtaining finer and better trained material as its students than the University of California. The standards of admission and instruction are of the highest. On medical instruction and scientific investigation, including the medical school, the University hospital, and the Hooper Foundation for Medical Research, the University's expenditure is now two hundred thousand per annum, but the University's medical work will be seriously hampered until an endowment of at least two million dollars is provided for the splendid $615,000 hospital building private benefac-

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Ye Building Gossip

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IF THIS committee
GIVES THE car load of sand
TO A competitor
WE WILL kill the committee,
BECAUSE THEY would
SELL IT for
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OR RING your cow bell.

tion has now provided. On the foundations of this great building, on the Parnassus avenue heights in San Francisco, high up above Golden Gate Park, the excavators and concrete men are now busily at work. A picture of the hospital, designed by Lewis P. Hobart, is shown elsewhere in this number.

Top Light Shade Company Has an Improved Fixture

The Top Light Shade Company which has been manufacturing for about a year a high grade shade for offices, school buildings, etc., has recently perfected a new device that is not only more practical than the old shade, but is much easier to install and less expensive. The new top light can be used on any style of window or other opening utilized for the purpose of illumination or ventilation. It shuts out part of the light or all of it, and it does this effectively, easily and quietly.

Many devices have been used in an endeavor to secure an adjustable shade. The latter is one which can be adjusted so that it will shut out the light from either the top, center, or bottom of a window, and conversely, for the purpose of illumination, must admit the light either through the top, bottom, or entire window space. This must be accomplished through something better than a make-shift. The top light is the solution of the problem.

Particularly in offices, factories, and schools, two and sometimes three shades are used to a window in order to accomplish this. According to its manufacturers, the same work is done far better with one top light. So-called adjustable shades have been used in many buildings, but they are clumsy of operation and unstable. Some of these shades served their purpose, during the period of evolution, in preparing the way for the perfect shade—the top light.

The top light shade is operated by a cord, which hangs at the side of the window and is fastened to a triple pulley. By pulling the cord, holding it slightly out from the casing, the shade is rolled up. On releasing the cord the shade catches automatically.

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It is not necessary to release it in any particular way—merely let go of the cord. To lower the shade the cord should be held out slightly from the casing, thus releasing the catch, the shade rolling down by gravity. The shade never becomes soiled or crumpled through striking the floor. The shade itself is lengthened or shortened through the operation of a cord in the center of the shade, as is customary with the ordinary curtain.

The top light shade always works, can be fitted to any opening and is said to be the most durable shade on the market.

The factory and office of the Top Light Shade Company are at 737 Market street, Oakland. Among the buildings that have been equipped with these shades are a number of the Oakland public schools, one of the Oakland stations of the Pacific Telephone Company, the Armijo high school, at Fairfield, designed by Architect Henry C. Smith, and many other prominent buildings.

This company is preparing to have agencies in all the large cities throughout the coast.

Cabot's Shingle Stains on the Home of Redwood

In finishing the Home of Redwood, which was illustrated in a recent number of this magazine, it was thought desirable to retain the beautiful grain of the redwood. The roof was finished with redwood shakes and a mighty artistic effect was created by not covering up the grain of the wood.

The shakes were protected and the grain of the wood left exposed by the use of Cabot's Creosote Shingle Stain. The shakes were dipped in this and were thus protected against the weather. The creosote carries the stain into the wood and colors the wood in the same way that dye colors cloth—without covering it in any way. The value of creosote as a wood preservative is well known to everyone.

Samuel Cabot, Inc., who make this shingle stain, have many colors to select from in this class of work and are ready to suggest color schemes for various kinds of houses. Full information will be sent to anyone addressing them at 15 Oliver St., Boston, Mass.

Architect Wins Suit

An architect recently won a suit for commissions (148 Northwestern Reporter 364) which the Supreme Court of Michigan gave a verdict awarding plaintiff recovery for services rendered as an architect in connection with the construction of a building in Detroit, as against 66 objections urged by defendant owner. In allowing recovery of extra compensation for changing the plans after the contract had been let, the court says: "The record shows that after the contract had been let defendant desired changes to be made, so that the commercial building so-called would contain a larger number of stores and produce a greater rental. There would seem to be no good reason why plaintiff should not recover for this item, if the changes were made at the request of defendant, and after the contract for erection under the original plans had been entered into."

Defendant also sought to diminish plaintiff's recovery on the ground that he permitted ornamental plaster to be applied in a defective manner, resulting in quantities of it falling later. This claim was based on the statement that the building was kept insufficiently heated in the course of construction, but was overruled by the Supreme Court in the following language: "It is clear that the contractor was under no obligation under his contract to supply heat. The building was erected in midwinter. * * * Not having, in the contract, provided that the builder furnish the heat, we think that the owners must be held to have assumed that duty."

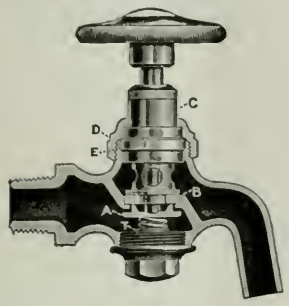
Again defendant claimed to have been damaged because the floor of the auditorium was changed from one involving the use of steps to a gradual incline. But the court finds that since this was done at the request of a lessee of the building, and without objection on the part of the owner, who was present and noted the change, no claim could be based on such change.

Another ground on which defendant sought to abate recovery by plaintiff was that plaintiff, who resided in another city, did not inspect the building more than twenty times in the course of its construction, but the court decided this point in

the architect's favor on a showing by him that a representative of the owner agreed to act in the capacity of "clerk of the works." Other grounds upon which defendant sought to defeat recovery were disregarded by the court as being palpably untenable

Why One Architect Lost a Client

Said the capitalist: "I shall not employ Mr. —— to draw plans for my new apartment house. He designs showy buildings, plans beautiful lobbies, marquises, etc., but he is careless about the fittings and fixtures. For instance, I have had to replace nearly all the plumbing in my other apartment house which he designed but three years ago."



The Bashlin Faucet

The above tells the story and this is why manufacturers of high class fixtures find that a large share of their work consists of replacing instead of originally installing. Take the case of the Bashlin faucet, made in Warren, Pa., the manufacturers of which have opened an office and warehouse in San Francisco. They have hardly had time as yet to make the acquaintance of the architects, so busy have they been in replacing the fixtures in scores of leading hotels, apartment houses, etc., where the faucets were found to be unsatisfactory. The Bashlin agents, Mr. G. Robert Brockmann and Mr. S. C. Haigh, under the firm name of the Brockmann Supply Co., have offices at 320 Market street, San Francisco, where a full line of the famous Bashlin faucets (both compression and self-closing) and the Bashlin valves can be seen. These faucets and valves are a distinct novelty owing to their ingenious construction, which permits repairs being made while under full water pressure, also for several other good reasons which are explained in a circular just issued.

Architects should investigate the Bashlin faucet, which Mr. Brockmann or Mr. Haigh would be pleased to demonstrate at any place most convenient. The following buildings, among many others, have replaced their old faucets with the Bashlin:

Hahnemann hospital, De Leo apartments, White House, Hotels St. Francis, Stewart, Granada and Victoria, Langendorf Baking Co. (valves), Thomas Dye Works (valves), Child's Dairy Lunch, Mendocino State hospital, St Winifred's hospital, St. Joseph's hospital, St Francis hospital, Mechanics Institute building, Humboldt Bank building, Olympic club, Children's hospital, Alaska Commercial building, Sterling laundry, Pacific Gas and Electric Company, Adler sanatorium, Maryland Dairy Lunch, Hotel Shattuck, Berkeley, Hotel Dorchester, First Federal Trust Company, Hof Brau cafe, Bellevue hotel, Buena Vista sanatorium, Hale Bros., Family Club and Merchants Exchange building.

The Bashlin faucet is absolutely guaranteed to give satisfaction in every service for which they are intended.

John M. Bickel

The death of Mr. John Milton Bickel, founder of Bickel's American Keene Cement, occurred at his home in Berkeley, September 22. Mr. Bickel had been in poor health for a year or more. He was well known as the president of the American Keene Cement Company and his associates will miss his counsel and kindly interest keenly. His two sons will continue to take an active interest in the management of the company.

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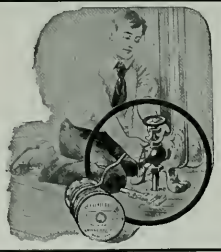

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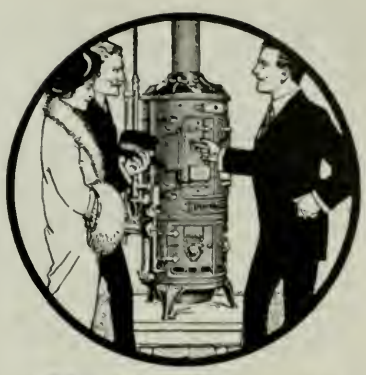
Decision Interests Architects and Builders

Numerous points of interest to contractors, architects, owners and bonding companies were decided by the Minnesota supreme court in its ruling on a Ramsey county church case. A brief statement of the case follows: Syllabus: First.—A building contract provided that whenever the architect should certify that the contractors were in default, and such default should continue for three days after written notice thereof, the owner might complete the contract at the expense of the contractors, and that the architect should determine the amount of expense incurred by the owner for that purpose which determination should be conclusive upon the parties. After partially performing the contract, the contractors became financially embarrassed and were unable to complete it and so informed the owner. By agreement the contractors superintended the performance of the remainder of the work and the owner paid the bills for the labor and material necessary to complete it. The contractors approved all such bills and gave written orders to the owners to pay the same before they were paid. Held, that the parties themselves having admitted the default and agreed upon the amount expended by the owner in consequence thereof, there was no occasion for having such questions determined by the architect, and that the owner could recover for such expenditures without having the amount thereof or the necessity therefor determined by him.

Second.—The contractors gave a surety bond which required the owner to notify the surety of any act on the part of the contractors involving a loss for which the surety was responsible immediately after the owner had knowledge thereof. Held: (1) That omitting to give notice of the failure of the contractors to complete the contract within the stipulated time, no damage being claimed for such default, did not relieve the surety from liability for other defaults; (2) that the existence of claims against the contractors aggregating less than the amount which would become due them from the owner within four days from the time the owner learned thereof, and which were promptly paid out of such amount, did not constitute a default within the meaning of the bond; (3) that in the absence of prejudice from the delay, a notice given October 9, of a lien which came to the knowledge of the owner October 4, was sufficient where the intervening time had been occupied in ascertaining the financial condition of the contractors.

Third.—A provision in the bond that suit must be brought within six months after breach of the contract, refers to a breach which gives a right of action upon the bond, and a suit brought within six



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Current Prices of Building Materials

These quotations furnished by reliable San Francisco and Los Angeles dealers

(Names and addresses will be supplied upon request.)

SAN FRANCISCO PRICES

Common Red Brick, $9 00 per M, ex. cars.
No. 1 Pressed Brick, $35.00 to $40.00 per M; Wire cut, $35.00 per M.
No. 1 Red Pressed Brick, $20 00 to $30.00 per M.
Red Stock Brick, $14.00 to $16 00 per M.
California Portland Cement, C L $2.30 per bbl.; L.C.L. $2.55 per bbl.
White Cement: Atlas, $6.00; Medusa, $6 00 per bbl.
Sand and Gravel mixed, 70c per ton, F. O. B. cars.
Sand (washed, screened river sand) 65e per ton, F.O.B. cars.
Bank Sand, $1 00 per cu. yd.
Roofing Gravel, $1.40 per ton.
Crushed Rock or Gravel, 75e per ton.
Red Roofing Tile, $22.00 to $25.00 per square, laid.
Brick Lime, $1 35 per bbl., C/L.
Finish Lime, $1.50 per bbl., C/L.
Hardwall Gypsum Plaster, $11 00 per ton, carload; 1150 per ton, ex. warehouse.
Oregon Pine, Rough Common, 1 x 3 to 1 x 10, $13.00.
Oregon Pine, Rough, 2 x 3 to 2- 12, $15.00.
Oregon Pine 1 x 4 T. & G. Flooring, No. 1, $31 per M; No. 2, $28; No. 3, $24.
Oregon Pine T. & G. Ceiling, No. 1 and 2 mixed, $26 to $28.
Redwood, Rough Common, 1 x 4 and up, $20 00.
Redwood, Rough Common, 2 x 3 to 2 x 10, $20.00 to $22 00.
Redwood Rustic, No. 1, $35 00; No. 2, $32 00.
Redwood Ceiling, No. 1, $29 00; No. 2, $26.00.
Redwood Shingles, No. 1, $2 40 full count.
Red Cedar Shingles, Star-A-Star, $2 40 full count.
Pine Lath, $2 40 per M.
Metal Lath, 13 to 25c per yd., according to quality.
1 x 3 Oak Flooring, Q. S. Clear, $116 00 per M; Select $75 00 per M.
½ x 2½ Oak Flooring, Q. S. Clear, $96 00 per M; Select, $74 00 per M.
1 x 3 Maple Flooring Clear, $71.00 per M; Clear White, $85 00 per M.
White Lead in Oil, 8¼c per lb.
Dry Red Lead, 8c per lb.
Boiled Linseed Oil, 74c gal. Raw Linseed Oil, 72c gal.
Turpentine, per gallon, 63 to 70c in bbls.
Dry Shellac, 35c per lb., variable.
Hyloplate Blackboard, 25 to 35c per foot, installed.
Composition Flooring, 25 to 30c per foot, laid.
Genuine Slate Blackboards, 40 to 50c per foot, erected.

LOS ANGELES PRICES

Common Red Brick, No. 2, $4 50 per M.
Clinker Brick, $9.00 per M.
Pressed Brick, $35 00 per M.
Enameled Brick, $65 00 per M.
Red Roofing Tile, $12 00 and $15 00 per square (not laid).
White Cement, $6 00 per bbl.
Portland Cement, $2 30 per bbl.
Lime, $1 50 to $1 75 per bbl.
Hardwall Plaster, per ton, $9 90 ex. whse.
Oregon Pine, Rough Common, 1 x 3 up, $19 00 to $22 00 per M.
Oregon Pine, Rougb Common, 2 x 3 up, $17.00 to $21 00 per M.
Oregon Pine Flooring, 1 x 4, No. 1, $40 00; No. 2, $35 00; No. 3, $22 50 per M.
Oregon Pine Ceiling, 1 x 4, No. 1, $36.00; No. 2, $31 00.
Redwood, Rough Common, $20 00 to $24 00.
Redwood Rustic, No. 1, $38 00; No. 2, $33 00 per M.
Redwood Ceiling, 1 x 4, No. 1, $33 00; No. 2, $28 00 per M.
Redwood Shingles, 4 bdls. to M, No. 1, $2 25; No. 2, $1 75.
Red Cedar Shingles, 4 bdls. to M, Star-A-Star, $2 75.
Pine Lath, 1½ in. x 4 ft., $3 25 per M; 1⅝ in. x 4 ft. $3 65 per M.
White Lead in Oil, 8½c per lb.
Red Lead, dry, 8½c per lb.
Raw Linseed Oil, bbls., 65c gallon.
Boiled Linseed Oil, bbls., 65c gallon.
Turpentine, bbls., 63 to 70c. gallon.
Crushed Rock and Gravel, $1.65 per yard.
Sand, 85c per yard.

SACRAMENTO PRICES

Common Brick, $7.00 per M, C/L.
Pressed Brick, Wire Cut, $30.00 per M, C/L.
Portland Cement, $2.40 per bbl. carloads.
Crushed Rock and Gravel, 85c per ton, ex. cars.
Sand, $1.00 yd. on cars.
Roofing Gravel, $1.50 per ton.
Lime, $1.35 bbl.
Hardwall Plaster, $13.00 per ton, ex. whse.

STOCKTON PRICES

Common Brick, $7.75 per M, del.
Face Brick, Wire Cut, $31.00 per M C L.
Cement, $2 40 per bbl., C/L.
Crushed Rock and Gravel, 90c ton.
Sand, 90c.
Roofing Gravel, $1 50 per ton.
Lime, $1.35.
Hardwall Plaster, $13.00 ex. whse. per ton.

FRESNO PRICES

Common Brick, $9 50 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2 84 per bbl., C/L.
Crushed Rock and Gravel, $1 35 per ton.
Black Face Brick, $25 00 per M—P. O. B.
Sand, $1.00 per yd., del.
Roofing Gravel, $1 85 per ton.
Lime, $1.50 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

BAKERSFIELD PRICES

Common Brick, $9.00 per M, del.
Face Brick, Wire Cut, $37.00 per M, C L.
Cement, $2.77 per bbl., C/L.
Crushed Rock and Gravel, $1 80 per ton.
Sand, $1.00 per yd., del.
Roofing Gravel, $2 00 per ton.
Lime, $1.50 per bbl.
Hardwall Plaster, $15 00 per ton, ex. whse.

NORTHERN CALIFORNIA POINTS

Common Brick, $11 00 per M, del.
Face Brick, Wire Cut, $35 00 per M, C L.
Cement, $2 65 per bbl.
Crushed Rock and Gravel, 85 to 90c per ton, C/L
Sand, $1 00 per yard.
Roofing Gravel, $1 50 per ton.
Lime, $1 40 bbl.
Hardwall Plaster, $14 00 per ton, ex. whse.

months after such right of action accrues is brought within the prescribed time.

Fourth.—The payment of a nonlienable claim, filed as a lien, out of funds then due the contractors and by their order, is without prejudice to the surety.

Fifth.—Failure to submit a case to the jury as required by chapter 245, laws 1913, where it clearly appears that such submission could not have changed the result, is error without prejudice.

Sixth.—There were no material errors in the rulings upon the admission of evidence.

Affirmed. —TAYLOR, C.

No Canopies in New City Hall

There will be no canopies in the courtrooms of the new San Francisco city hall. Some of the superior judges wanted them, thinking the old-fashioned canopy essential for judicial dignity, but the architects, Messrs. Bakewell & Brown, declared that canopies were out of date and would not harmonize with the fittings as planned. As a compromise, the height of the ornamental paneling back of each superior judge's elevated seat will be increased, $1,000 being allowed by the supervisors for this additional work.

$100,000 Subway Planned

Roseville, (Placer county).—C. M. Kipp has presented to the city trustees plans for a subway at the Southern Pacific Railroad crossing. Kipp is a former railroad man and has drawn complete plans for a subway. They call for a structure 240x80 feet level under the tracks, the inclines to have a grade of six per cent and the bottom of the subway to be ten feet below the present level of the sidewalks. It is estimated the work will cost $100,000.

Bakersfield Postoffice

Plans are being completed by Acting Supervising Architect James M. Wetmore, Treasury Department, Washington, for a new postoffice building at Bakersfield. The appropriation for this structure is $250,000.

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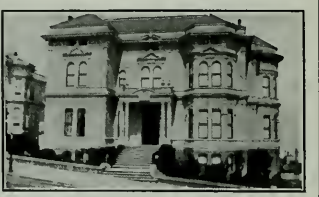

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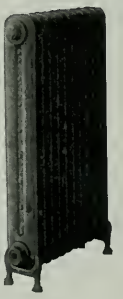

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J. B. Nabors & Sons Make New Connections

State Insurance Commissioner J. E. Phelps has revoked the license of the Commonwealth Bonding and Casualty Insurance Company to operate in California, the company being in the hands of a Receiver. The company is surety on many large bonds for public contracts and for public officials. The company has been represented in San Francisco and Los Angeles by J. B. Nabors & Sons who have made connections with other and much stronger concerns so that they will be enabled to continue their business and replace the policies of their clients satisfactorily.

The following letter referring to the existing conditions is sent us for publication:

October 2, 1915.

The Architect and Engineer,
Monadnock building, San Francisco.

Gentlemen:

Referring to the suspension of the Commonwealth Bonding & Casualty Insurance Company, for the time being at least, we beg to advise that J. B. Nabors & Sons have made much stronger connections than they have had heretofore with other companies, and will proceed actively in writing all kinds of bonds and casualty insurance as heretofore.

We are re-writing all of our present policies now in the Commonwealth Bonding and Casualty Insurance Company in other companies where the assured so desires, and it is the policy of this agency to go its limit at all times to protect the policy holders and give them good service in the adjustment of any claims or any difficulties that may arise, and we shall continue to assist in looking after the affairs of the Commonwealth in this city until the same has been satisfactorily closed, so far as it is in our power to do so. At this time, we see no reason why the Company should not be able to take care of all of its claims in the State of California and elsewhere.

Thanking you for your inquiry in this connection, we are, with best wishes,

Very truly yours,
J. B. NABORS & SONS.

Oakland Libraries

It is reported on good authority that the remaining three branch library buildings to be erected in the city of Oakland will be designed by former city architect John J. Donovan, Dalziel building, Oakland. The fourth building, at Melrose, was designed by architect Wm. H. Weeks, and bids for its construction have been taken. Each library is expected to cost from $30,000 to $40,000.

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Meeting of the San Francisco Chapter A. I. A.

A special meeting of the San Francisco Chapter of the American Institute of Architects was held in the Borghese Room, St. Francis hotel, Saturday, October 9th, at 10 o'clock.

At this meeting, the president, Mr R. Clipston Sturgis and other officials of the American Institute discussed informally the re-organization of the institute, its by-laws and the institute's relation to the various chapters.

In view of the importance of the changes now taking place in the institute and its reorganization, the attendance was larger than usual, the members showing a desire to become thoroughly conversant with the proposed by-laws of the institute, the adoption of which will be voted upon at the December meeting in Washington, D. C.

After the adjournment, lunch was served in the Red Room.

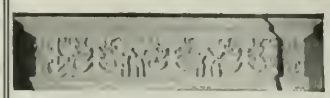
President W. B. Faville presided.

Co-operative Exhibit of Furniture Manufacturers

This is located at 1055 Market street, San Francisco, where it occupies five floors. It was the idea of Mr. Harry J. Moore, a pioneer San Francisco furniture dealer, that Grand Rapids could be brought to San Francisco, and as one walks through the crowded floors this seems to have been realized. Here are gathered sample lines of the various articles handled by furniture dealers and include goods of both Eastern and local manufacturers, comprising furniture, stoves, refrigerators, vacuum cleaners, draperies and floor coverings, shades, spring beds, gas mantles, kitchen cabinets, picture frames, medicine cabinets, etc. The exhibitors are supplied with free telephone service, desk room, information bureau, reading room, etc.

Dieckmann Reports Good Business

"Business is fair to good," says the Dieckmann Hardwood Co., who reflect in their own experience the improved business conditions in the lumber and building trades. The Dieckmanns have had a very good demand for West Coast mahogany, this wood having resumed its former place as a prime favorite for the interior trim of fine residences, also many high class clubs, hotels, apartment houses, etc. As every lumber firm has a well known specialty with which its name is identified, so it is that "Dieckmann" and "mahogany" are linked together so closely as to have become almost synonymous.



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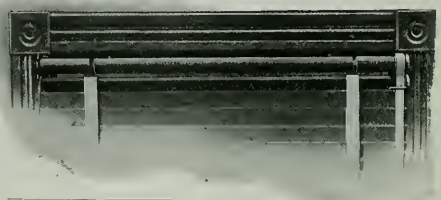

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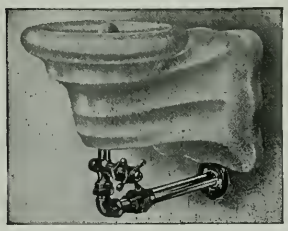

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Praise for Medusa Cement

One of the many instances where Medusa White Portland Cement was selected on account of its superior quality, suitability and decorative features, is the San Jose State Normal School, and W. D. Coates, Jr., connected with the State Engineering Department at the time the building was designed, has written the Medusa company, under date of October 14, 1914, as follows:

In regard to the San Jose Normal School building for which I was the architect, will say that while in San Jose last Saturday, I visited the building for the first time in about three years and am pleased to state that age has improved the appearance of same about 100 per cent. This is caused by the fact that the exterior cement has toned down to an even texture and all scaffold marks are gone, the brick inlay has aged too, and the two blend together in a very pleasing way. Also the vines and plants around the place lend interest to the entire mass.

There are twenty-eight buildings that I erected at the Agnew State Hospital, Agnew, Cal., along the same lines of construction, and most of these were covered with Medusa White Portland Cement and have stood the test of time to the extent that there is not a crack anywhere.

Branch Carnegie Library

John Reid, Jr., formerly a member of the Consulting Board of Architects of the city of San Francisco, recently completed plans for the Doe Valley Carnegie branch library, for which Andrew Carnegie has donated about $40,000. Mr. Reid has made a very attractive design with terra cotta exterior and clay tile roof. The superstructure will be steel and brick. A feature of the building will be a large children's reading room.

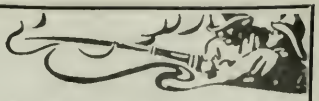
Bids for the erection of the building have been taken and the general contract probably will go to P. A. Palmer, electric wiring to Central Electric Company, and heating to Gilley-Schmid Co.

Increased Demand for Elevators

The B. C. Van Emon Elevator Co., Inc., say that their orders during the past three weeks have exceeded in volume those of three months previously. This increase of business is for both new elevators and a large amount of repair work and alterations in old buildings. Mr. B. C. Van Emon is a recognized authority on elevator construction and the prosperity of his company shows that San Francisco architects and builders recognize the necessity of consulting "one who knows."

Plans Being Prepared

Architect Wm. A. Newman is preparing plans for a two-story and basement frame and plaster residence to be erected at Rockridge at a cost of $10,000. There will also be a garage.



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Nothing will ever prevent fires, but a serious fire is inexcusable. Fire cannot become a hazard if a building is divided into proper units.

Fire becomes a powerful engine of destruction only in proportion to what it has to feed upon. No one determines this but yourself.

The remedy: The **Dahlstrom Products** make possible the total elimination of wood and other inflammable trim. In an otherwise fireproof building the **Dahlstrom Products** make the structure a multiple of units. Each division is virtually a separate building because fire will not and cannot eat its way from one multiple to another.

Fireproofness is not all that commends the **Dahlstrom Products.** There's the finish—cost of up-keep — sanitation — durability — each worth understanding correctly.

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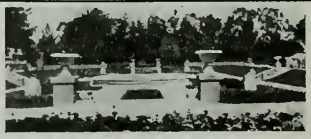

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- Dunnavant-Oakley Co., 1430 Powell St., San Francisco.
- Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
- Collman & Collman, 526 Sharon Bldg., San Francisco.
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- Van Sant, Houghton Co., Hooker & Lent Bldg., San Francisco.
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- McLaren & Peterson, Sharon Bldg., San Francisco.
- Masow & Morrison, 518 Monadnock Bldg., San Francisco.
- John Monk, 216 Sharon Bldg., San Francisco.
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- "Pabco" Damp Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
- Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

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- Newbery Electrical Co., Humboldt Bank Bldg., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
- H. S. Tittle, 245 Minna St., San Francisco.
- Standard Electrical Construction Company, 60 Natoma St., San Francisco.

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Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.
B. C. Van Emon Elevator Co., 235 First St., San Francisco.

ELEVATOR ENCLOSURES
J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

ENGINEERS
W. W. Breite, Clunie Bldg., San Francisco.
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

ESTIMATORS
Alfred Alt, 335 Eighth St., Oakland.

FIRE EXIT DEVICES
Russell & Erwin Mfg. Co., Commercial Bldg., San Francisco.

FIRE ESCAPES
Burnett Iron Works, Fresno, Cal.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIREPROOF PAINT
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.
W. P. Fuller & Co., all principal Coast cities.
Guido Blenio Fireproofing Co., Inc., 605 Sharon Bldg., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. H. Andrews, 728 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison streets, San Francisco.
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLAG POLE TOPS
Bolander & Hallawell, 270 First St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., San Francisco.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES
Torrid Zone furnace sold and installed by Modern Sheet Metal Works, 731 Clement St., San Francisco.

GAS FURNACES
Cole Gas Furnace, Fisher & Klauser, distributors, Lick Bldg., San Francisco, 1764 Broadway, Oakland.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.

GARDEN FURNITURE
G. Tomagnini & Co., 219 Tenth St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier-Coburn Co., Howard & Beale Sts., San Francisco.

GRANITE
American Portland Stone and Granite Co., foot of Tenth Ave., E. Oakland.
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Division and Potrero Sts., San Francisco.
McGilvray-Raymond Granite Co., 634 Townsend St., San Francisco.

GRAVEL, SAND AND CRUSHED ROCK
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
American Keene Cement Co., 333 Monadnock Bldg., San Francisco.

HARDWARE
Corbin Hardware sold by Baker & Hamilton, San Francisco and Los Angeles.
Russwin Hardware, Joost Bros., San Francisco.
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.
Russell & Erwin Manufacturing Co., Commercial Bldg., San Francisco.

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD FLOORING
- Parrott & Co., 320 California St., San Francisco
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Strable Manufacturing Company, Oakland, California.

HARDWOOD LUMBER
- Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
- Parrott & Co., 320 California St., San Francisco.
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Strable Manufacturing Company, Oakland, California. (See advertisement above.)

HEATERS—AUTOMATIC
- Pittsburg Water Heater Co., 237 Powell St., San Francisco.
- Hoffman Heater Company, 429 Stockton St., San Francisco.

HEATING AND VENTILATING
- American Heat & Power Co., Oakland, Cal.
- Fess System Co., 220 Natoma St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Mangrum & Otter, Inc., 507 Mission St., San Francisco.
- Modern Sheet Metal Works, 731 Clement St., San Francisco.
- Charles T. Phillips, Pacific Building, San Francisco.
- M. & W. Rotary Oil Burner, manufactured by Industrial Equipment Co., 527 Howard St., San Francisco.
- William F. Wilson Co., 328 Mason St., San Francisco.
- Scott Company, 243 Minna St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
- Petersen-James Co., 730 Larkin St., San Francisco.
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.

HEAT REGULATION
- G. E. Witt Company, Inc., 850 Howard St., San Francisco.
- Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
- Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento, and Chamber of Commerce Bldg., Portland.

HOSPITAL FIXTURES
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.

INGOT IRON
- "Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
- Robert W. Hunt & Co., 251 Kearny St., San Francisco.

JOIST HANGERS
- Western Builders' Supply Co., 155 New Montgomery St., San Francisco.

KEENE CEMENT
- American Keene Cement Co., Monadnock Bldg., San Francisco.

LAMP POSTS
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.

LIME
- Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.

LIGHT, HEAT AND POWER
- Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Sunset Lumber Co., Oakland, Cal.
- Santa Fe Lumber Co., Seventeenth and De Haro Sts., San Francisco.
- E. K. Wood Lumber Company, East Oakland, California.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
- Tilden Lumber Company, foot of Unversity Ave., Berkeley, Cal.
- Van Arsdale-Harris Lumber Company, Fiftb and Brannon Sts., San Francisco.

MILL WORK
- Dudfield Lumber Co., Palo Alto, Cal.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.

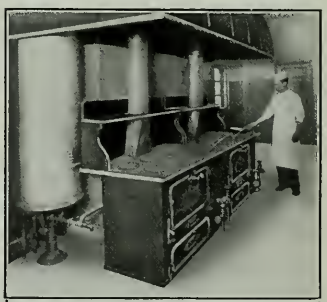
MAIL CHUTES
- Cutler Mail Chute Co., Rochester, N. Y. (See Adv. on page 28 for Coast representatives.)

MANTELS
- Mangrum & Otter, 561 Mission St., San Francisco.

METAL CEILINGS
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
- U. S. Metal Products Co., 525 Market St., San Francisco.
- Capitol Sheet Metal Works, 1927 Market St., San Francisco; 117 Franklin St., Oakland.

METAL FURNITURE
- Capitol Sheet Metal Works, San Francisco and Oakland.
- A. H. Andrews Co., 728 Mission St., San Francisco.



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ARCHITECTS' SPECIFICATION INDEX—*Continued*

METAL SHINGLES
- Meurer Bros., 630 Third St., San Francisco.
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

OIL BURNERS
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- American Standard Oil Burner Co., Seventh and Cedar Sts., Oakland.
- W. S. Ray Manufacturing Company, 218 Market St., San Francisco.
- Fess System Co., 220 Natoma St., San Francisco.
- M. & W. Oil Burner, manufactured by Industrial Equipment Co.,
- T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
- Rotary Oil Burner Company, 159 Twelfth St., Oakland.
- G. E. Witt Oil Burner Company, 850 Howard St., San Francisco.

ORNAMENTAL IRON AND BRONZE
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Brode Iron Works, 31-37 Hawthorne St., San Francisco.
- Burnett Iron Works, Fresno.
- Palm Iron & Bridge Works, Sacramento.
- J. G. Braun, Chicago and New York.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., Sain Francisco.
- Shreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINTING AND DECORATING
- D. Zelinsky, 564 Eddy St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). (See Adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Trus-Con Stone Tex., Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Concreto Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Trus-Con Bar-Ox, Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Bay State Steel Protective Coating. (See page 30 for coast agents.)
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, represented in San Francisco by Marion D. Cohn Co., Hansford Building.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.
- Jones-Duncan Paint Co., 414 Ninth St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 113 Front St., San Francisco.

PHOTO ENGRAVING
- California Photo Engraving Co., 121 Second St., San Francisco.

PHOTOGRAPHY
- R. J. Waters Co., 717 Market St., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- Pacific Sewer Pipe Co., I. W. Hellman Bldg., Los Angeles.
- Pratt Building Material Co., Hearst Bldg., San Francisco.
- Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PLASTER CONTRACTORS
- A. Knowles, 985 Folsom St., San Francisco.
- C. C. Morehouse, Crocker Bldg., San Francisco.
- Hermann Boseb, 2054 Market St., San Francisco.

PLUMBING CONTRACTORS
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Petersen-James Co., 730 Larkin St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Alex Coleman, 706 Ellis St., San Francisco

PLUMBING FIXTURES, MATERIALS, ETC.
- J. B. Clow & Son, Hearst Bldg., San Francisco.
- Crane Co., Second and Brannan Sts., San Francisco.
- California Steam Plumbing Supply Co., 671 Fifth St. San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Improved Sanitary Fixture Co., 612 Metropolitan Bldg., Los Angeles.
- Miller-Enwright Company, Sacramento, Cal.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Western States Porcelain Co., San Pablo, Cal.
- Wm. P. Wilson Co., 328 Mason St., San Francisco
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.
- Bashlin Faucets, sold by Brockmann Supply Co., 320 Market street, San Francisco.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PUMPS
Chicago Pump Company, 612 Howard street, San Francisco.

RADIATORS
"Presto" Sanitary Radiators (see page 28 for Pacific Coast Agents.)

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

REVERSIBLE WINDOWS
Hauser Reversible Window Company, Balboa Bldg., San Francisco.

REVOLVING DOORS
Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco.
Kinnear Steel Rolling Doors, W. W. Thurston, agent, Rialto Bldg., San Francisco.
Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
Grant Gravel Co., Flat Iron Bldg., San Francisco.
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
National Roofing Company, Plaza Bldg., Oakland.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Building, San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

ROOFING TIN
Meurer Bros., A. H. MacDonald, agent, 630 Third St., San Francisco.

SANITARY DRINKING FOUNTAINS
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Haws' Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley.
J. B. Clow & Son., Hearst Bldg., San Francisco.

SASH CORD
Samson Cordage Works, manufacturers of Solid Braided Cords and Cotton Twines, 88 Broad St., Boston, Mass.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
A. H. Andrews & Co., 728 Mission St., San Francisco.

SCHOOL FURNITURE AND SUPPLIES—Cont'd
Whitaker & Ray-Wiggin Company, 776 Mission St., San Francisco.

SEWAGE EJECTORS
Chicago Pump Co., represented by Telephone Electric Equipment Co., 612 Howard street, San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Capitol Sheet Metal Works, 1927 Market St., San Francisco.
U. S. Metal Products Co., 525 Market St., San Francisco.
Modern Sheet Metal Works, 731 Clement St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SLATE ROOFING
Fiberstone & Roofing Co., 971 Howard St., San Francisco.

STEEL AND IRON—STRUCTURAL
Burnett Iron Works, Fresno, Cal.
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Brode Iron Works, 31 Hawthorne St., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Western Iron Works, 141 Beale St., San Francisco.
Woods, Huddart & Gunn, 444 Market St., San Francisco

STEEL PRESERVATIVES
Bay State Steel Protective Coating. (See page 30 for coast agents.)
Wadsworth, Howland & Co., Boston Mass. (See Adv. for Coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.

ARCHITECTS can make no mistake in specifying
OLMSTEAD ARTIFICIAL SLATE
SCHOOL FURNITURE THEATRE AND CHURCH SEATING
SCHOOL SUPPLIES OF ALL KINDS
WHITAKER and RAY-WIGGIN CO., 776 Mission Street San Francisco

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ALL KINDS OF LUMBER AND MILL WORK

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RUSSWIN HARDWARE

RUSSELL & ERWIN MANUFACTURING CO.

The American Hardware Corporation, Successor

New Britain, Conn. 833 Market Street, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL BARS FOR CONCRETE
- Kahn and Rib Bars, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Woods, Huddart & Gunn, 444 Market St., San Francisco.
- Pacific Coast Steel Co., Rialto Bldg., San Francisco, and Union Oil Company, Los Angeles.

STEEL MOULDINGS FOR STORE FRONTS
- J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

STEEL FIREPROOF WINDOWS
- United States Metal Products Co., San Francisco and Los Angeles.

STEEL ROLLING DOORS
- Kinnear Steel Rolling Door Co., W. W. Thurston, Rialto Bldg., San Francisco.

STEEL WHEELBARROWS
- Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
- American Portland Stone and Granite Co., foot of Tenth Ave., East Oakland.
- California Granite Co., 518 Sharon Bldg., San Francisco.
- Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
- Colusa Sandstone Co., Potrero Ave. and Division St., San Francisco.
- McGilvray Stone Company, 634 Townsend St., San Francisco

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
- S. F. Bowser & Co., 612 Howard St., San Francisco.

SURETY BONDS
- California Casualty Company, Merchants' Exchange Bldg., San Francisco.
- Globe Indemnity Co., Insurance Exchange Bldg., San Francisco.
- Fidelity & Deposit Co. of Maryland, Mills Bldg., San Francisco.
- Pacific Coast Casualty Co., Merchants' Exchange Bldg., San Francisco.

TEMPERATURE REGULATION
- Johnson Service Company, 149 Fifth St., San Francisco.
- G. E. Witt Company, Inc., 850 Howard St., San Francisco.

THEATER AND OPERA CHAIRS
- A. H. Andrews, 728 Mission St., San Francisco.
- C. F. Weber & Co., 365 Market St., San Francisco.
- Whitaker & Ray-Wiggin Company, 776 Mission St., San Francisco.

TELEPHONE EQUIPMENT
- Telephone Electric Equipment Co., 612 Howard St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
- Mangrum & Otter, 561 Mission St., San Francisco.

TILE FOR ROOFING
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
- Denison Hollow Interlocking Blocks, Forum Building, Sacramento.

VITREOUS CHINAWARE
- Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

VACUUM CLEANERS
- Invincible Vacuum Cleaner, R. W. Foyle, Agent, San Francisco.
- Spencer Turbine Cleaner, sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
- "Tuec" Air Cleaner, manufactured by United Electric Co., 110 Jessie St., San Francisco.

VALVES
- Jenkins Bros., 247 Mission St., San Francisco.

VALVE PACKING
- "Palmetto Twist," sold by H. N. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
- W. P. Fuller Co., all principal Coast cities.
- Glidden Varnish Co., Cleveland, O., represented on the Pacific Coast by Whittier-Coburn Co., San Francisco.
- R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
- Standard Varnish Works, 113 Front St., San Francisco.
- S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
- C. F. Weber & Co., 365 Market St., San Francisco.

WALL PAINT
- San-A-Cote and Vel-Va-Cote, manufactured by the Brininstool Co., Los Angeles; Marion D. Cohn Co., Hansford Bldg., San Francisco, distributor.

WALL BEDS
- Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BOARD
- "Amiwud" Wall Board, manufactured by Parafine Paint Co., 34 First St., San Francisco.

WATER HEATERS—AUTOMATIC
- Pittsburg Water Heater Co. of California, 237 Powell St., San Francisco, and Thirteenth and Clay Sts., Oakland.
- Hoffman Heater Co., 429 Stockton St., San Francisco.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
- Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
- Concreto Cement Coating, manufactured by the Muralo Co. (See page 5.)
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- Glidden's Concrete Floor Dressing and Liquid Cement Enamel, sold on Pacific Coast by John King & Sons, 36 Stanford St., San Francisco.
- Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.
- Imperial Co., 183 Stevenson St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
- Wadsworth, Howland & Co., Inc. (See Adv. for Coast agencies.)

WHEELBARROWS—STEEL
- Western Iron Works, Beale and Main Sts., San Francisco.

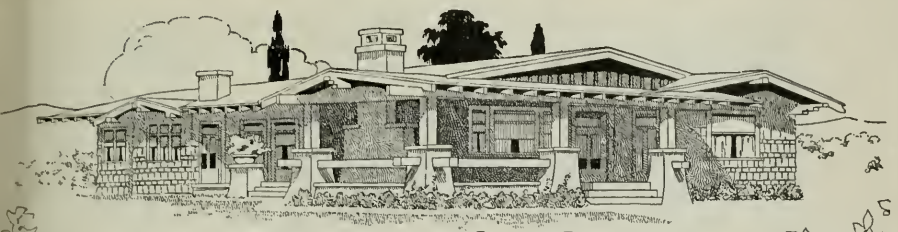
WHITE ENAMEL FINISH
- "Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
- "Silkenwhite," made by W. P. Fuller & Co., San Francisco.
- "Satinette," Standard Varnish Works, 113 Front St., San Francisco.
- Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Co. (See Adv. for Coast distributors.

WINDOWS—REVERSIBLE, ETC.
- Hauser Reversible Window Co., Balboa Bldg., San Francisco.

WINDOW SHADES
- Top Light Shade Co., 737 Market St., Oakland.

WIRE FABRIC
- U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
- Fink & Schindler, 218 13th St., San Francisco.
- Mangrum & Otter, 561 Mission St., San Francisco.



Bass-Hueter Shingle Stain Stands the Sun and the Rain

Wood decays because the natural oil is taken out by sunshine and rain.

A roof or a shingled house will stand exposure for years if a *good* shingle stain has been applied.

The stain protects the wood and the color adds the beauty.

Bass-Hueter Superior Shingle Stain is specially prepared for the Pacific Coast.

First of all, it is the best stain for redwood and other lumber grown on this coast.

It also contains ingredients selected to stand the many months of sunshine and the rainy season.

Being made on the Pacific Coast, the manufacturers know the conditions and when we offer you

Bass-Hueter Shingle Stain

you are getting the one stain that is best adapted for your house.

Don't neglect the roof. Keep it protected. Get a ladder right away—today if you can—make a thorough examination.

If it shows any effects from exposure—go to a painter at once and give him the job.

Insist that he use Bass-Hueter Shingle Stain; then you will not have this expense again for many years.

Twelve colors to choose from and each is a permanent preservative for shingles and all unfinished woods.

We carry a full line of Bass-Hueter Paints and Varnishes and know from experience that these are the best goods made for the climate and lumber of the Pacific Coast.

BASS-HUETER PAINT CO.

816 Mission St. 1564 Market St.

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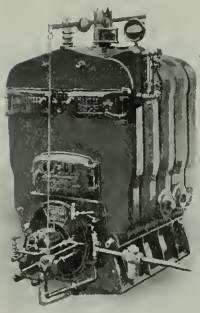

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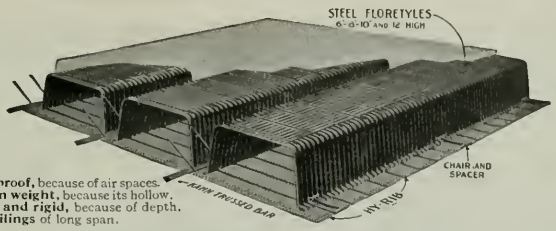

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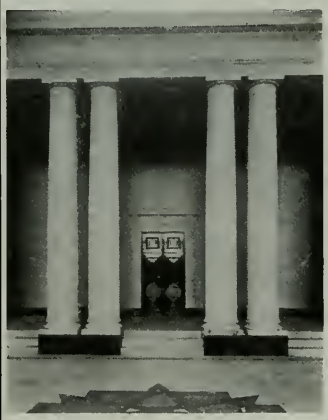

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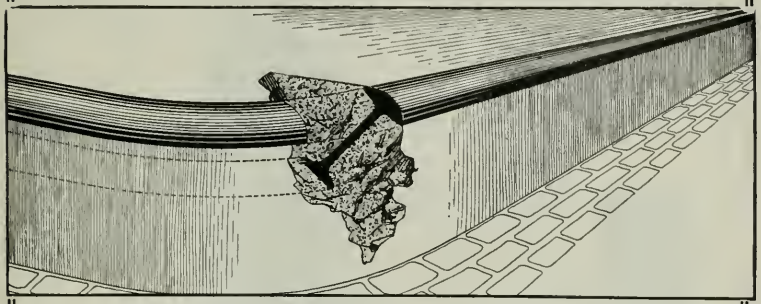

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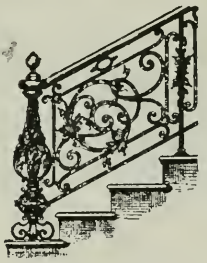

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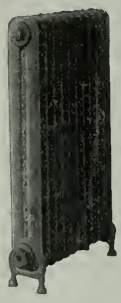

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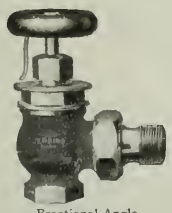

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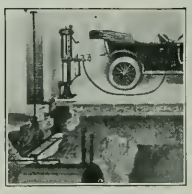

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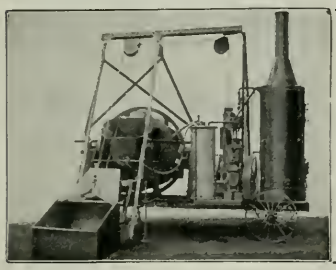

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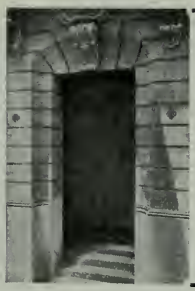

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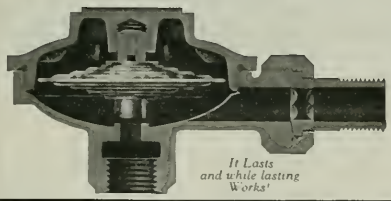

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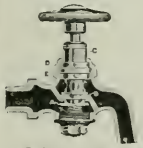

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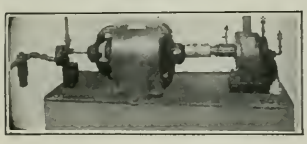

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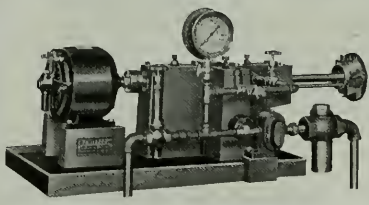

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FRONT MOTIF, HOUSE OF MR. LOUIS SARONI, SAN FRANCISCO
MACDONALD AND MACDONALD, ARCHITECTS

Frontispiece
The Architect and Engineer
of California
for November, 1915.

THE
Architect and Engineer
Of California

VOL. XLIII NOVEMBER, 1915 No. 2.

Residence Design

By KENNETH MacDONALD, JR., Architect

SHALL it be a house or a home? What a vast difference there is between the two? The former is usually just something to look at and the latter is a place to live in. There are probably ten houses built to every home.

The larger domicile, in price over say $50,000, is rarely or never a home. It is sometimes called by local newspapers a mansion. This word spells servants, luxury, too much food, automobiles and usually indigestion.

The mansion is the work of the architect proper. It is dignified and correct. It is usually a group of rooms forced within a pet facade appropriated from a foreign country without rhyme or reason. We have to do it to satisfy the vanity of the client who, when rich, insists upon making a showing. Are we justified in always leaning on the reputation of the old masters? Is it manly or truly American for us to always transplant our architecture when the opportunity presents itself? For this reason very few of the larger houses in this country are creditable. Their design is in a foreign language and in only a few cases has an attempt been made to even translate it into our own words. We lack pride in our own architecture. We lack the courage of our convictions. Residence architecture requires an entirely different temperament from what is required to design public or monumental buildings.

The residence architect must be an artist, he must be a lover of nature and a painter of it. He should know flowers. The home should be a part of the landscape and inseparable from it in both form and color. There is no better proof of this than in the work of Charles A. Platt, who for many years was a landscape architect and who became a designer of residences simply because the people of good taste saw no better way to get a harmonious result than by having the house made a part of the garden instead of having it take too important a part on the landscape. Mr. Platt's houses look like they have always been there. He seems to have taken only the American work as a precedent, the Colonial or Georgian influence predominating. His work is that of a gentleman and a man of culture. It seems that no word more accurately describes it than "elegance." His ornament is never sharp and crisp with newness but gives the impression of having been worn and softened by years of use. He seems to have placed each bit of ornament because he felt the actual need of it. Never can one wish to take any of it away.

From the appearance of some houses, although correct in every sense of the word, one almost feels that the architect knew too much about architecture, had traveled too much, had too many ideas. It would be best for the work of this country if the architects of Virginia and Maryland could never see anything but the Colonial work and could go on developing it until

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MacDonald and MacDonald, Architects

LIVING ROOM MANTEL, HOUSE OF MR. LOUIS SARONI
MacDonald and MacDonald, Architects

it would give America something of her own. This could also be said of the Spanish Missions of California. Such a style in the hands of Mr. Elmer Grey for instance, could gain for California an architecture entirely her own as a natural development of her birthright.

The California residence is undergoing a radical change on account of the popularity of outdoor sleeping. This will give rise to many forms of porches sheltered from the weather and will eventually force the bedroom into the dimensions of a dressing room.

Materials for residence work should be gathered, if in the country, from the neighboring timber or quarries if possible. This always gives an appropriate character and generally if no artificial coloring is applied, will produce a harmonious color scheme.

In residence work more than in any form of architecture the interior arrangement of the rooms can be made to express itself on the exterior.

The ideal way to design a country house would be to live on the premises in a temporary structure for a time and when the winds and sunshine are well understood to design the house in accordance with these. There is a natural propriety in using southeastern light for bedrooms and libraries, a western light in winter for baths and winter apartments and a northern light for picture galleries and such places where a steady light is needed. The culinary department should be on the northern side on account of the heat which is naturally generated in these rooms.

The exterior design of residence work is probably influenced more by the old Tudor examples than by any others. The Englishman is very domestic, he loves his home, works his own garden and usually builds a wall around it. He cares little for what the outside of this wall looks like, but inside one will invariably find all the picturesque beauty that flowers and vines can produce.

Houses with such accessories are the homes we learn to love.

* * *

A Lombard Tower

A new departure in American architecture has just been completed at the University Museum in Philadelphia. It is an addition to the general structure in the shape of a lofty tower 100 feet in diameter, which, like the rest of the building, is inspired by the Lombard architecture of the fourteenth century. This tower is one of the few structures ever erected without regard to cost. The word to the architects and builders was to spare no expense to make the tower itself all that art and money could achieve, for it is intended to be in and of itself one of the chief exhibits of the museum.

The tower contains in its lower story a perfectly circular auditorium 100 feet in diameter, with a flattened dome all lined with tile of a peculiar construction to get the best acoustic properties. It is believed to be the finest auditorium in America. The upper story of the tower is 100 feet in diameter, 100 feet high, with a dome, and all lined with light gray tiling. It is lighted entirely from the top and is an amazing piece of architecture because of its beautiful tone and its admirable proportions. The walls are six feet thick. The room is for exhibition purposes. With the completion of this addition the museum authorities are preparing to spend a million dollars more in extending the galleries to accommodate the rapidly accumulating specimens of archaeology and ethnology from all over the world.

A Southern California Architect's Visit to the Fair

Some Vivid Impressions Charmingly Told by Word and Pencil

By CHARLES G. ODD.*

AS we rounded Fort Scott at sunset, coming in through the Golden Gate, the lights in the Tower of Jewels were turned on. There it stood, majestic and imposing — glowing red — mysterious and magical like a mighty altar built by a mighty race to their mightiest God.

This was our introduction to the Great Exposition in San Francisco, the most hospitable city on earth. For the architect to describe the beauties of the "Big Show," it would take more paper to write it on than the "author" could afford to buy.

Entering the Exposition from Scott street, you are greeted by that immense structure, the Tower of Jewels, and you find that you have lost your power of thought; that is, just for a minute or two. Then you notice that right in front of it stands a wonderful fountain representing ENERGY. After you have been running around the grounds and got yourself all tired out, then you will understand why that fountain was put there to greet you.

Turning west you find the Hall of Horticulture, a building that at least the author has heard very little said about. And yet, who is the one among us that could conscientiously say that he could turn out a better design? Surely that big dome is a beautiful thing; and the garlands, the festoons and the rest of the gay ornaments on it certainly do make it strictly an Exposition Building. I was told that the man who helped this building to become a success, namely Mr. L. Bourgeois, designer in the employ of Messrs. Bakewell and Brown (an idealistic and patriotic Frenchman that he was), went to Europe and gave his life defending his country. When a man like that is lost to humanity and civilization, it makes one wonder whether some lives really are not worth more than others.

In front of the Hall of Horticulture stands a great piece of sculpture, "The End of the Trail," and behind it lies the Court of Palms, designed by Mr. Geo. W.

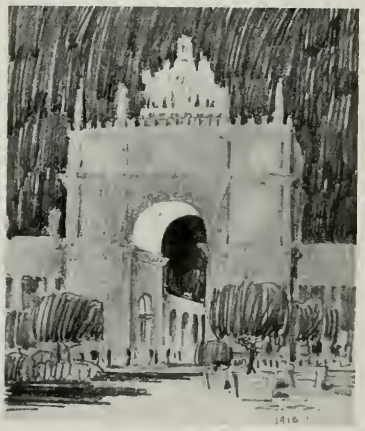
* Editor's Note:—Architect Odd's probably greatest work may be seen in the architecture of the main group of the Exposition buildings at San Diego, where Mr. Odd was engaged as architectural designer by the Exposition authorities.

Kelham. This court, as well as the Court of Flowers by the same architect, is very pleasing and impressive, showing some of the most delicate detail work on the grounds. The same may be said of the various entrances by Messrs. Bliss and Faville. They are really so perfect in design and workmanship, that the worst one could say about them is that they are too good.

The Court of the Universe is simply marvelous —that's all.

When you enter the Court of Ages you forget that you are on earth. The symbolism of the Fountain of Earth and of Echo Tower lends wings to your thoughts and to your imagination; and you feel your pulse quickened by the same Fire of Enthusiasm that inspired the architect to create this wonderfully original composition. Of course the architect had a strong impetus given him through the great Fountain of Earth by Mr. Robert Aitken, but I can think of only one man capable of building a court around this fountain with such acknowledged success, and that man is Louis Christian Mullgardt. Sitting in the Court of Ages, feasting on its beauty and moved by its many religious motives, I was praying that the man who planned it may have many more chances to create wonders like this for human beings to enjoy.

There is another architect who dared to originate, and that is Mr. Bernard R. Maybeck, the designer of the Palace of Fine Arts. With a good plan, exquisite elevations, splendid perspective and delicious landscaping; with motives individual and artistic in daring profusion, the Palace of Fine Arts stands there on the shore of the Lagoon reflecting its beauty. Commanding in its attitude, but silent in its expression, this building invites you to enter its sacred premises and help yourself to its immense treasures. A more impressive and elevating facade for a Palace of Fine Arts one could hardly dream of. Let us pray that the citizens of San Francisco may not lay hands upon this Great Temple, but that they may preserve it and leave it there, so that also those who were not able to visit San Francisco during the year of 1915, may be able to enjoy the most impressive feature of the entire Fair.



* * * *

When we left on the boat a heavy fog hung low over the city

of San Francisco. Passing by the Exposition only a few features were visible in the light of the setting sun. The big domes of the Palaces were a soft purple, the Column of Progress seemed to blush under the kisses of the departing sun and the California Building was turned pale at the approach of the night. The rest of the Fair was all blurred and hazy, giving your mind all the chance for a dream of Beauty Indescribable.

And as we sped on the lights grew dimmer and dimmer, * * * soon the fog swallowed it all, and in the mind of the dreamer only the impression of the Great Show remained to keep as a treasure of untold value.

Where the West Begins

Out where the hand clasps a little stronger;
Out where a smile dwells a little longer;
That's where the West begins.
Out where the sun is a little brighter;
Where the snows that fall are a trifle whiter,
Where the bonds of home are a wee bit tighter,
That's where the West begins.

Out where the skies are a trifle bluer,
Out where friendship's a trifle truer,
That's where the West begins.
Out where a fresher breeze is blowing,
Where there's laughter in ev'ry streamlet flowing,
Where there's more of reaping and less of sowing,
That's where the West begins.

Out where the world is in the making,
Where fewer hearts with despair are aching,
That's where the West begins.
Where there's more of singing and less of sighing,
And a man makes friends without half trying,
That's where the West begins.

Clay Products and Their Modern Application

By W. E. DENNISON*

ADDRESSES upon occasions of this kind are not always what they promise to be, but this paper will not be long, statistical or technical. It may be excusable to first take a few backward glances.

The ancients seem not to have known uses for clay beyond the making of bricks in the sun of Egypt, Assyria and Babylon, the turning of pots on the wheels of the Etrurians, Greeks and Romans, the pressing of water pipes in Rome, and the art of moulding ornaments in bas relief, which the Romans probably borrowed from the Tuscans. These ornaments were of great beauty of design. After being burned they were fastened with leaden nails to the frieze of the entablature of Roman edifices. A collection of these imperishable terra cottas belongs to the British Museum.

As the human stream pushed its westward flood toward the modern civilization the art of clay working found lodgment wherever Nature had deposited the finest grindings of her mills. Traces may still be found in Staffordshire, England, of potteries built by the Romans at the time of their invasion. The wheels on which first spun the clay of Albion were probably made from memory by conscript potters of the Roman legions. Invaders never carry into lands of conquest more than arms and a conquering spirit. With occupation comes peace and reversion of soul from things militant to things provident. 'Tis then we see the arts of peace lay gentle hand upon the spirit of man and small beginnings beguile the warrior from paths of destruction back into the fields of reproduction and the plants of preservation. Thus started and grew in England the greatest potteries the world had seen.

The art of clay working in America, while it may have flourished in the days of Atlantis, as indicated by vases found in prehistoric mounds of the Mississippi valley, seems to have had its beginnings on the wheels of English potters who followed the Mayflower in other ships and soon found it necessary to supplement the gourds of their first gardens with crock and jug for household use.

The primitive architectural use of clay in America, so far as our present civilization is concerned, was to chink the cracks between the logs and to "mud up" the chimneys of the first cabins. As success attended the ventures of the pioneers and ambition could command wealth, bricks from Holland were imported and laid in Knickerbocker homes, until kilns could be built for their domestic manufacture.

Wealth may be either inherited or acquired. The man who inherits wealth generally knows nothing, has many ideas and eventually learns much. The man who acquires wealth has but one idea, knows it all and seldom gets beyond that stage.

While wealth was in the process of acquisition this country saw great individual achievements principally. But as soon as wealth became a matter of inheritance there entered the necessity for its protection in inexperienced hands. Then grew combinations of capital, belonging to many in the hands of a few, which became great engines of production. No individual could compete with corporate control. Every great individual was forced to become a corporation. In no other way could he lay the ways upon which to build and launch his enterprises.

*President Steiger Terra Cotta and Pottery Works, San Francisco. Paper read during American Builders Week, San Francisco.

If you will take the foregoing paragraph and substitute the word pottery wherever the word wealth occurs, you will have a fair picture of what has occurred to some branches of the clay working industry.

In modern uses are to be found all of the applications of clay products known to peoples of ancient times. We can find no record of ancient knowledge and practice of propulsion by steam or electricity. These two agencies alone have furnished modern application of clay products to the problems of insulation and fire resistance in probably greater tonnage than all the recorded uses of clay products in ancient times.

The clay products of the United States have now reached an annual value of $200,000,000 and are increasing yearly at the rate of five per cent. From the history of the industry, one is justified in believing that much before the expiration of twenty, probably twelve, years the value will be doubled.

In the later seventies or early eighties some red terra cotta trimmings were made for a church in a New Jersey town by some Danish clay workers who had a small kiln near Perth Amboy. This I believe was the first instance of the manufacture of architectural terra cotta in America. It now represents one-tenth in value of the total clay products of this country. When one recalls the erection of the first sky-scraper in the nineties and considers the adaptability of terra cotta to the steel frame buildings of today, it violates no conservatism to predict for architectural terra cotta not only full retention of its unique place in architecture, but a very largely increased use.

About three years ago it occurred to a prominent Eastern manufacturer of architectural terra cotta to send a circular letter to every similar manufacturer in this country, setting forth some of the reasons why these interests should meet and organize for promotion of their art. It resulted soon in the formation of the National Terra Cotta Society, which immediately set to work on a book since published and entitled Standard Construction. It contains every known form of standard architectural design adaptable to terra cotta and shows the latest approved methods of applying these forms to modern building construction. It is the first complete work on this new art and should be in the working library of every architect and engineer.

One of the highest aims of architecture after attaining the perfect shelter is to adapt to visible parts of the structure such lines, carvings, configuration and colors as will not only delight the true artist but will catch, hold and unconsciously direct some impulse toward better things which every soul feels when brought into the presence of purity. When the architect has succeeded in doing this with perishable materials, it must give him much keener anguish than can come to the soul of him who admires but does not know that the elements will soon deface and destroy the beautiful picture; and even before that can take place utilitarian man, unworthy cumberer of the ground, brings home his drunken friend, Demolition, accompanied by that questionable character, Salvage. But what ecstacy must the artist feel when to his creation of form and color is given the quality of imperishability.

We have in our city numerous and notable instances of the enduring nature of clay products both in brick and terra cotta. Matured and vitrified in the fires of the kiln they easily defied the fury of the holocaust that swept this city in 1906. They stand today mute but unimpeachable witnesses to the fact that but for clay products in their modern application architecture would be a dismal and sluggish science wholly unequal to meet or interpret the aspirations of the modern world.

Fine Arts Palace Will Outlast Present Generation

Bernard R. Maybeck, who designed the Palace of Fine Arts at the Panama-Pacific Exposition, says the building will outlast the present generation without any attempt to make it more substantial. Maybeck says:

There seems to be a general impression that a large sum of money is needed in order to preserve the Fine Arts Palace.

The Fine Arts Palace is on United States property; eight columns and a piece of the altar are on Lyon street, San Francisco property.

The foundation is on piles and good soil.

The walls are of cement.

The roof is cement and glass.

The building is absolutely fire-proof.

The construction of the rotunda and colonnade and decorations is of wood, very heavy on account of the great concentration loads.

The colonnade was calculated to carry tons of wet earth, which was never put on to the roof.

The Fine Arts Palace was constructed by the best engineers the P. P. I. E. could find; if anything it is too strong. If San Francisco were shaken by an earthquake the Fine Arts Palace would be the last to go.

The staff work is cast. It is made of nephi plaster and wood fiber, is not put on with a trowel as on bungalows, but is stratified in the casting, like stone, and will not peel off.

If the Fine Arts Palace were in another climate the ornamental surface would soon be destroyed by ice, snow and heat, but in San Francisco Mission Dolores still stands, made of mud and straw.

If let absolutely alone the Palace of Fine Arts will outlast us.

It has cost $700,000.

* * *

Honor for Architectural Student

Clyde S. Payne, Jr., son of Dr. Clyde S. Payne, 1350 Jones street, San Francisco, has been awarded the highest honors at the University of Pennsylvania Architectural School, according to a letter received by the young man's father. The honors have been conferred twice during the past two years, and each time Payne has carried away the laurels from competitors in all the leading architectural schools of the East.

Young Payne, who is now in his third year at Pennsylvania, was formerly a student at the Mount Tamalpais Military Academy. He entered the Eastern institution to take up architectural work and began to attract attention from the first for the imagination and technique displayed in his designing.

Last year in a designing competition with Harvard, Massachusetts Institute of Technology, Columbia, Cornell and other institutions, he carried away the "first mention commended" honors, which is the grand prize of the student competition. This year, by winning the same honors again, Payne becomes eligible for scholarships to continue study at Paris and Rome. These will be awarded in May, 1916.

Payne is a prominent member of the Phi Gamma Delta fraternity and the Mask and Wig honor society at Pennsylvania. He intends to go to Paris and Rome regardless of the scholarship awards, according to his father, spending two years in each city after graduation in 1917.

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SAN MATEO SUB-STATION, SAN MATEO, CALIFORNIA
Designed by Ivan C. Frickstad

Some Sub-Stations of the Pacific Gas & Electric Co.

By IVAN C. FRICKSTAD*

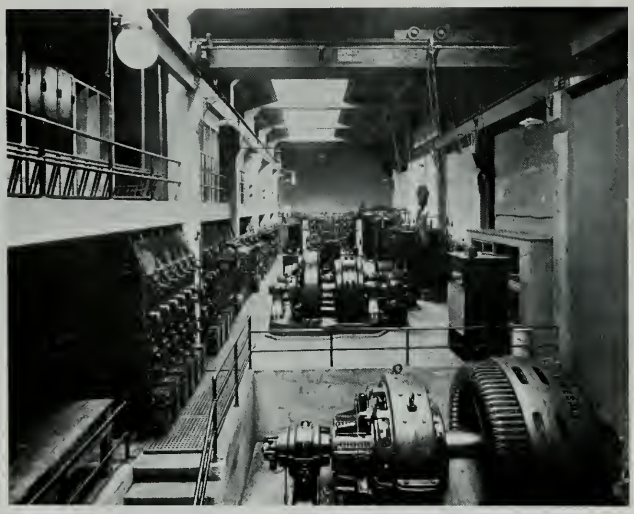
THE Pacific Gas & Electric Company is the largest of its kind in the West and one of the three or four largest in the United States, pioneers in hydro-electric power development, long high tension transmission lines, high pressure gas mains, and other activities bearing directly, as well as indirectly, upon the actual prosperity and comfort of the people of California.

It is only fitting and proper that the buildings comprising such a system, especially so when it is made up of a number of plants which are dependent upon one another for the perfect fulfillment of their specific mechanical functions, should be made to express this relationship by carrying a consistent architectural theme throughout the system which fulfills the mechanical requirements as well as the function of utility.

This has been gradually brought about in the buildings constructed by this company during the last four or five years and the illustrations shown here bear testimony of the progress made and illustrate the most modern of the corporation's buildings.

It is not as it was once, that "anything would do," so far as the appearance of the buildings was concerned. When the pioneering days had passed and a number of generating plants and distributing systems operating throughout Central California had been amalagamated into one large system and a policy of continuous, perfect service ("Pacific Service") established, it was eminently consistent that the appearance of all that was to be in evidence to the eyes of the public should be pleasing and capable of inspiring confidence in the company's strength and ability to deliver perfect service in the fullest sense, uninterrupted service being absolutely necessary to the many important industries and to the comfort of the people at large dependent upon the company for power.

*Mr. Frickstad is the architectural assistant to the civil and hydraulic engineer of the Pacific Gas and Electric Company of San Francisco.



INTERIOR STATION "G," SAN FRANCISCO
Willis Polk & Co., Architects

In this article only buildings of the "Electrical Department" of the Pacific Gas & Electric Company are shown, although there are a great many more which have to do with other activities of the company, such as the "Gas Department," Street Railroad System in Sacramento, water systems, such as Stockton Water Plant, office buildings of the various Districts, as well as the main offices in San Francisco, and many others.

The electrical sub-stations have developed along two general types, a "City" type used in the large city centers and an "Out-of-Town" type used for sub-stations located outside and in the smaller city centers. The "City" type has developed as a windowless building, as it has been found that a windowless building gives the maximum economy in arrangement, that it provides unbroken wall surfaces which are needed for attaching various parts of the installation, and makes possible the insulation against the noise of the station operation disturbing the neighborhood in which it may be located. As all power leads are brought in underground, windows are not required for this purpose. Nor are they needed for light and ventilation since the interior is flooded with light to best advantage from skylights in the ceiling, and ventilation is best accomplished through air ducts with openings in the floor and louvres in the roof. This has given the designer an opportunity to treat wall surfaces with but one opening to consider. This is the main entrance and is treated as such by the concentration of ornament at this point. The individuality of each station is expressed architecturally in the detail of its composition and ornaments. Also in such other features of its environment as may be peculiar to it.

Station "G," located on the northwest corner of Ellis and Broderick streets, San Francisco, was the first of this type to be constructed. It is finished in white cement. The large door with cartouche centering over same as shown in the illustration was the center of the original building. The third panel was added at later date. Willis Polk & Co. were the architects.

Station "D" was the second of this type and is shown by two views, the front, or Bush street elevation, and the rear, or Fern avenue elevation. This station presented some unusual problems as Fern avenue is twelve feet lower than Bush street and the head room of the portion of the building used for storage batteries was low in comparison with that required in the main portion of the sub-station. The solution resulted in making the roof of the battery room a formal garden to the sub-station with fountain and pools. Through the fountain runs the water from the transformers of the station, which is thus cooled and used again. The bottom of the pools are constructed of sidewalk lights which give plenty of light in the battery room. This station was also designed by Willis Polk & Co.

Station "J" is located in the commercial district of San Francisco on Commercial street east of Montgomery. All the ground space is here covered by the building in order to obtain sufficient room for the necessary installation. It was also found necessary to build to considerable height. The main room where are located the generating units, is open to the roof, a height of 48 feet, and at the end are two balcony floors on which are located the switchboards and switch cells. The main floor and wainscoting to a height of first balcony floor is tiled, the walls above are panelled and finished in an imitation caen stone, with the ceiling finished smooth and colored to match. The side walls are hollow and the space used as an air duct through which a fan located in the space over the second balcony discharges fresh air. A large skylight with side vents floods the building with light and completes the ventilating system. Ornamental iron stairways, bronzed, connect the main floor with sidewalk and balconies and add the finishing touch to this interior. The architect was Mr. Frederick H. Meyer.

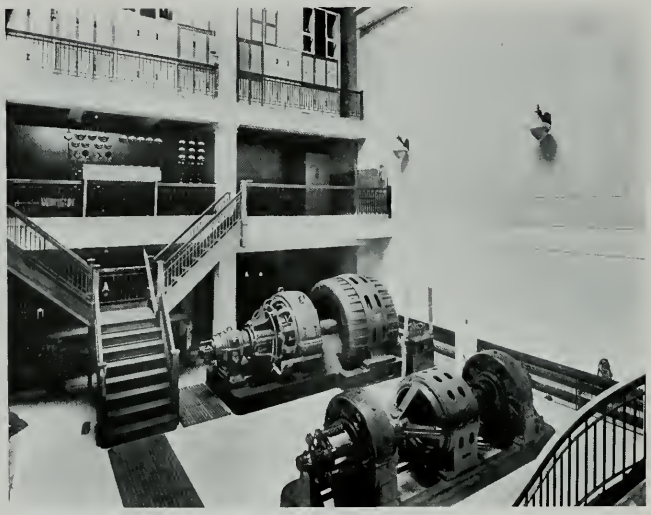
Station "S," while not belonging to the Electrical System, does belong to the same "City" type. It is a steam generation station from which steam at high pressure flows into an underground system of pipes supplying apartment houses, hotels, theatres and factories, where it is used for heating, cooking and various other purposes. This building was also designed by Mr. Frederick Meyer.

Station "K," the latest of the electrical sub-stations to be built in San Francisco was both designed and built by the Engineering Department of the Pacific Gas & Electric Co., under the direction of Mr. H. C. Vensano, civil and hydraulic engineer. The architectural problems were handled by the writer.

STATION "D," BUSH STREET ENTRANCE
Willis Polk & Co., Architects

STATION "D," FERN AVENUE SIDE
Willis Polk & Co., Architects

STATION "J," PACIFIC GAS & ELECTRIC COMPANY
FREDERICK H. MEYER, ARCHITECT



INTERIOR, STATION "J," SAN FRANCISCO
Frederick H. Meyer, Architect

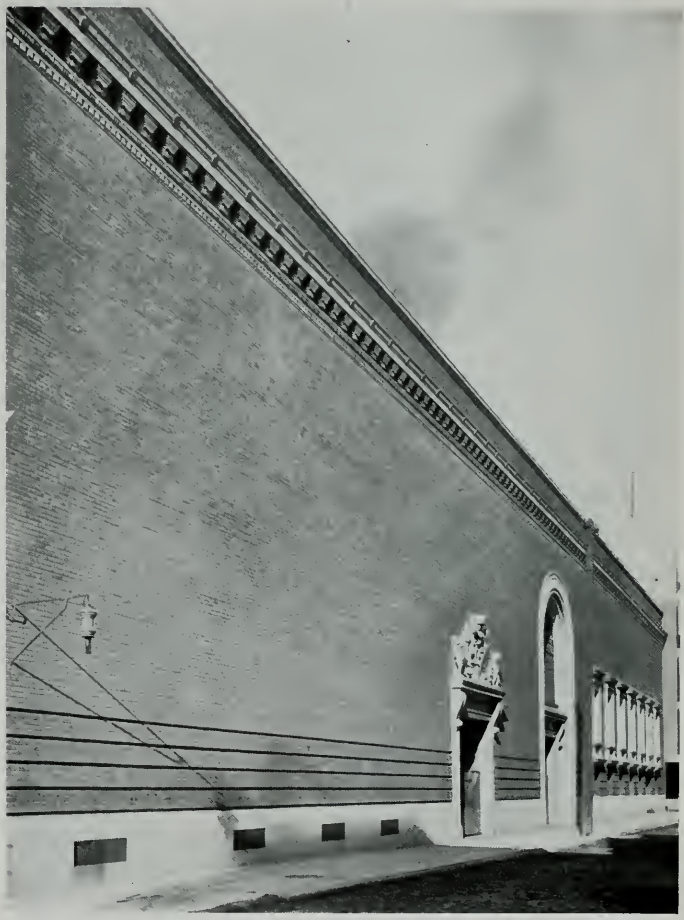
The station is located on the northwest corner of 24th avenue and Balboa street in the Richmond District, San Francisco, and is planned to house six motor generating sets with auxiliaries. Only one-third of the building, or 48 feet of its length has been constructed. The ultimate building will be 72 feet wide by 110 feet long with another entrance on the 24th avenue side.

In addition to the individuality of the station being expressed in the detail of the composition and ornaments, a further distinction has been obtained in texture and color. Owing to the large flat wall surfaces without openings, a uniform color and texture is inclined to be flat and uninteresting. This is relieved by finishing the corner rustications and moulded members in a troweled sand finish and the flat surfaces by roughening by sand dashing. The color is obtained from the materials used and is a light buff or a deep lime stone color. A difference in tone effect is obtained by the use of the smooth and rough textures, and the whole has been given a setting of lawn with groups of shrubbery placed to advantage. In the garden on the west side has been located the water cooling tower (which had previously been located on the roof) placed over a pool in the center of the garden and enclosed with lattice which will eventually be covered with vines, thus utilizing this necessary feature of the mechanical installation to add beauty to the environment of the station.

The exterior of the building is illuminated from the cement posts near the curb on top of each of which a 500 watt nitrogen lamp is enclosed by a cement hood, so adjusted that the light is thrown directly on the building and reflected into the street. The source of the illumination

STATION "K," RICHMOND DISTRICT, SAN FRANCISCO
Designed by Ivan C. Frickstad

STATION "S," SAN FRANCISCO GAS & ELECTRIC CO.
Frederick H. Meyer, Architect



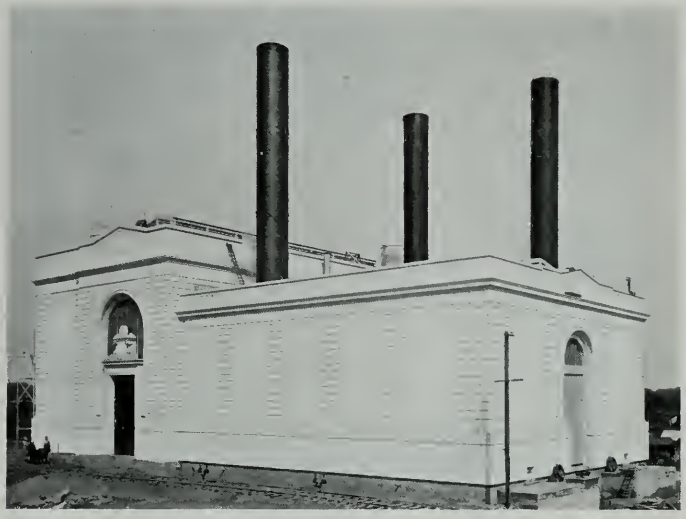
STATION "C," SAN FRANCISCO GAS & ELECTRIC COMPANY
WILLIS POLK & CO., ARCHITECTS

INTERIOR, STATION "C," SAN FRANCISCO
Willis Polk & Co., Architects

being concealed, makes this station, which is on a hill, the most conspicuous and prominent building of the vicinity. Particular attention is called to this indirect exterior illumination which is believed to be a novel feature in electrical station design. The interior is illuminated by indirect lighting fixtures placed near the ceiling and finished to match the ceiling. Each fixture contains a 750 watt nitrogen lamp with an X-ray reflector. A complete gas illuminating outfit has also been installed as a direct lighting system. These fixtures are placed on the columns.

Station "C," the central sub-station of the San Francisco District, is located on that portion of Minna street between Third and Fourth streets, and which is a blind alley. Because of this fact, few people realize its existence or have an opportunity of viewing this very fine piece of work in red brick and cream colored terra cotta. It was the first of the company's sub-stations in San Francisco to be designed and built with reference to the exterior appearance. While it does not conform to the "City" type as it was built before the type was developed, it is shown here because it is one of the finest appearing sub-stations to be found anywhere, and is also the largest at the present time of the City sub-stations. The central portion as marked by the large central opening is the sub-station, while the west end is used as a storage battery room and the east end for company's garage.

The detail of the terra cotta is exceedingly fine, the ornament over the small entrance well modeled and at one time (before the fire of 1906) there was a like group over the main entrance, but this unfortunately has been destroyed. The soft cream color of the matt glazed terra cotta, in combination with the slightly rough face of the dull red stock brick and the granite base with rusticated in the brick work above, creates an



RIVER STATION, SACRAMENTO, CALIFORNIA
Willis Polk & Co., Architects

impression of being a substantial, solid structure of refined lines and finish. It was designed by D. H. Burnham & Co., architects, from their San Francisco office.

River Station as shown here is the company's steam turbine generating plant at Sacramento. It was designed in the "City" type by Willis Polk & Co. Its location on the shore of the river, a short distance from the city and surrounded by green fields, backed up by woods, with the river in the foreground gives it a very pleasing setting.

To obtain the electric energy that is transformed and distributed from these sub-stations to the consumer it is necessary to transform water pressure into electric energy. This in itself is a gigantic undertaking, where it is done on such a scale as to be of real economic value. It is either accomplished by placing the waters of the high mountain watersheds under control or else by transforming water by the medium of heat to steam pressure and then to electric energy. Both methods are used in building up this most perfect transmission system which must deliver constant, uninterrupted service. The interiors of two of the fourteen power houses developing electric energy by two methods are shown as well as one of the many artificial lakes where the mountain waters are impounded until required.

An adaption of Spanish Renaissance style of architecture was developed for the "Out-of-Town" type because of its adaptability to the many exacting conditions and requirements of each station. The early traditions of the State had much to do with the selection of this style. Especially so, since the Pacific Gas & Electric Company have been pioneers in their field, whose

DETAIL OF FACADE, CORDELIA SUB-STATION
DESIGNED BY *IVAN C. FRICKSTAD*
H. C. VENSANO, *ENGINEER*

PERSPECTIVE, CORDELIA SUB-STATION
DESIGNED BY IVAN C. FRICKSTAD

DRUM POWER HOUSE, HYDRO-ELECTRIC PLANT
Designed by Ivan C. Frickstad

efforts have been such as to have largely to do with the uniform and staple development of the State as a whole.

Somewhat the same conditions exist in these sub-stations as in the City sub-station, except that the power leads come and go through windows which are necessarily placed with a certain overhead clearance and thereby give large, flat, unbroken surfaces beneath them. This agrees well with the fundamental principle of Spanish Renaissance, i. e., the universal concentration of ornament at a few salient points.

Cordelia sub-station is the central distributing station of the system with power leads connecting direct from the hydro-electric plants in the mountains entering through large windows in the front or entrance side and leaving through smaller windows in the rear and leading in all directions to smaller sub-stations located with reference to various distribution centers. Two high voltage lines will enter this station when it is eventually completed (one wing being as yet unconstructed), one on each side of the central feature in which is located the switchboard.

The building stands on the side of a hill, with hills rising at either side and a higher range in the background. On the slope in front, a number of oak trees grow a little below and to either side of the entrance. A pond for cooling the transformer water and the pump-house with its tiled roof and buff colored walls, a necessary adjunct to the plant, are also adjacent.

Power Houses Nos. 4 and 5 of the projected extension of the South Yuba-Bear River development are practically twins and are hydro-electric generating stations. As such they are especially related and in a general way are made therefore to conform in architectural treatment to Cordelia's entrance side by means of the large square window course. The two stations will be distinguished from one another by the treatment of the entrance and retaining walls.

Woodland and San Mateo sub-stations are on the distributing side and are related to this side of Cordelia. Woodland has the same small square

window course, continuous around the building and plain wall treatment. Its cornice and roof lighting scheme constituting its individuality. The light globes installed on the ornamental iron posts spaced five feet apart and continuous around the crest of the roof have made this station a landmark at night time for miles around. As the power leads to the San Mateo sub-station are brought in underground the window scheme was not required. The cornice and parapet wall treatment similar to those of Cordelia are the means employed to show its relationship to the central station. The plain wall surfaces are pierced with openings, giving this station its individuality.

These buildings are all built of reinforced concrete and plastered. The plain surfaces are finished in white cement, colored a light buff and roughened slightly by the stippling process. The mouldings are smooth finished, giving them an effect of being lighter, and the whole is crowned with varying tones of red Spanish tile. They have all been planned, designed and constructed by the Engineering Organization of the company, as mentioned in connection with Station "K."

Thus is a system being built up through co-operation where each unit presents a substantial and pleasing appearance, a welcome addition to its neighborhood, and expresses its relationship in the system.

* * *

Choosing Architects by Competition

ALTHOUGH architectural competitions are frequently used as a means of choosing architects or of securing preliminary designs, it is very doubtful, says the Engineering Record, whether this method is conducive to best results. Engineers are comparatively free from this practice except in the design of some structures such as small bridges. A few years ago when an engineer submitted a plan for a bridge he was very apt to find himself in competition with one or more bridge companies, but now, even in this branch of engineering, it is common practice to employ an engineer who prepares his own designs, which are then submitted to bridge companies for bids. Architectural competitions are generally of no advantage to the owner. To make them successful he must first choose an advisor, whose duty it is to formulate the terms on which the competitors must base their designs and to conduct the competition. The American Institute of Architects has given this matter considerable attention, and under the code of that society it is unprofessional for any member of the institute, or of a chapter thereof, to participate in a competition, whether as competitor or as junior, unless the programme shall first have been approved by the committee on competitions of the institute or by an authorized subcommittee. A contest of this kind is a slow and expensive process of choosing an architect, and in a great majority of cases it would be much better if he were chosen directly and solely upon his fitness to design and to superintend the work. It is possible that a competition may bring forth a meritorious general design for a building, and the author thereof be so entirely lacking in executive ability and in the technical knowledge necessary to prepare detailed designs as to be incapable of carrying the work to successful completion.

Schools for a Generation

By WILLIAM L. WOOLLETT, Architect

THE question as to the type of school to be erected in the small towns and cities of California is surrounded by the usual combination of practical and aesthetic considerations, i. e., questions of locations and cost of buildings, and the balancing of these with expediency as to permanence of construction, liberality of arrangement, etc.

However we may differ as to means and methods, there is always the common ground of ultimate good to the child to unite and inspire those who would solve the problem.

First, as to the choosing of site—both consideration of the child good and economy suggest the selection of ample areas for the school — that such ample spaces are more readily acquired away from congested centers of population and therefore less convenient for some pupils is not a serious drawback.

It were better for the scholars as a whole and cheaper economically to supply transportation for some pupils than that all should be denied the copious areas for light, air, playgrounds, etc. The advancing value of land in certain carefully selected localities would more than offset the cost of transportation involved in the selection of such sites.

Second, as to the type of building—should the buildings be permanent and fireproof and two or three stories high, or shall they be low, rambling vine-covered temporary affairs—or a combination or compromise of these opposite ideas? The tendency in California for suburban districts particularly, seems to be in the direction of home-like picturesque, one-story buildings of the Patio type. The idea back of this movement appears to be that we should build our schools for a generation, of transient material, safe and low to the ground, and with a good, big proportion of the earth's surface apportioned for the site thus insuring to the next generation, not only the necessity for a new, crisp, modern school suited to the needs and new ideals of a later generation, but providing through the increased land values the means whereby this ideal may be accomplished.

The life of a frame building properly constructed is conservatively from twenty-five to thirty-five years with occasional minor repairs and roof renewal, etc. The life of any building, fireproof or frame, from the standpoint of appearance and comfort and permanence of the interior, the part for which the school is chiefly constructed, is not much more than this length of time. After twenty years of constant use any school building looks, and is, worn: casings are worn and battered, cut and splintered; stair rails loose, balusters broken; plaster cracked; blackboards scratched and notched; upper floors worn almost through in places; toilets and other sanitary equipments are likely to be more or less out of order—undoubtedly out of date. The psychological effect of most buildings which have been used for a generation is not one of crispness to say the least. The best school should be retrimmed and thoroughly renovated each generation.

In thirty years about forty per cent of the original cost of the building would go into the occasional repairs and the necessary complete renovation required at the end of that period. Assuming such a school to cost a hundred thousand dollars, the permanent value residing in the fireproof and structural portions would be about $60,000. Now, a non-fireproof structure affording the same accommodation in the one-story form would probably cost about $75,000 and would of course have to be torn

down at the end of thirty years. In the first case, the newly finished fireproof building, the additional expense at the end of thirty years would be $40,000 and in the other $75,000, or a difference of some $35,000 in favor of the more permanent type. Now, let us assume that the original cost of the land for the fireproof school (inside property) was $12,500 and for the larger wide-spreading suburban type was $25,000, and let us assume that the value of both plots of land trebled in thirty years, not an unfair assumption for this community, in one case there would be an increase of value of $25,000 and in the other $50,000, the difference in increment being $37,500, and quite enough to justify the additional cost of land involved in the selection of the site at first hand, besides the incidental fact that there is $75,000 available to build a new school. If the proportion of money invested in land were larger, the gains naturally would be correspondingly large. Of course the more congested the location at the time of the original purchase, the more stable the value, and the further from centers of population, the more speculative the character of the investment.

Schools should be placed on large areas of land as near the main lines of communication as possible but away from business centers. They in turn will become the nucleus for centers of small business on account of the grouping of homes convenient to the school, especially if traction lines be conveniently located.

A cleverly conceived school program in any growing city the size of Berkeley ought to net splendid returns inside a generation. For instance, ample athletic grounds could be provided in fast growing districts. As soon as this land increased in value these general utilities could be removed to less costly property, the difference in land values paying the price for more elaborate improvements on the less costly property.

An argument against the frail, temporary wood structure compared with the more dignified, permanent building is that of fire danger. Of course, in the one-story building the fire danger is negligible. As to the increased insurance for contents of building, the saving is insignificant as compared with the good of the child, accruing from ample spaces, home-like atmosphere, fresh air, play rooms, etc., all of which are part of the suburban school idea.

Also there is a certain propriety in the idea of permanence in any public building and for that reason there is more or less prejudice against a temporary school house structure. Unconsciously we desire that the stability of our institutions should be reflected in the quality of our school buildings, court houses, etc. As a contribution to civic pride, to the superficial observer at least, a large, square, two or three-storied brick building, standing monument-like in the midst of a group of bungalows and vine-clad cottages is certainly imposing.

To satisfy the craving for the stable and dignified, to comply with this national demand for high values and real worth in a public building, I would select the Aula or assembly room of the school for particular embellishment. This room should be of ample dimensions and dignified proportions, and so handled architecturally as to suggest that it has been built of permanent building material. This room should harbor a few objects of real value in the realm of art, possibly an appropriately placed mural painting, a piece of real statuary or bronze and a mantel of majestic proportions which would give an air of dignified hospitality and suggest the domestic quality of the public spirit which this room is intended to foster.

The permanent ideals of life reside in ideas and institutions and not in architecture as expressed in cement and stone. However, this may be true, it still remains that the fitting symbol of our ideals and institutions is in monuments of permanence.

I would therefore suggest that in order to carry out the complete cycle of our legitimate demands the higher grades, for instance the high school grades, be housed in permanent fireproof buildings of a highly dignified character. These buildings should be centrally placed upon small areas of comparatively high-priced ground. A building of this character should be placed prominently in respect to main arteries of circulation and if possible should be part of a group in the city plant. The athletic grounds of the upper grades should be separate from the schools on less expensive grounds in the suburbs, where even tennis and golf may be provided for.

And the lower grades should, in all cases, be housed in temporary one-story structures on ample areas, the location of which could be shifted as the centers of population change.

* * *

Who Is An Architect?

By CHARLES C. RICH.*

(Concluded from October Number.)

The Architect and His Function in Building.

AN ARCHITECT is not a contractor; he does not build buildings, and does not have a money interest in the material or labor which enter into a building. He is a disinterested and expert adviser—an arbitrator in whom the owner, as well as the contractors, can place confidence. He has a complete understanding of the entire project as a whole, and is able to correlate one unit with another. He begins his work by learning, first, as intimately as he can the needs and preferences of his client; he then studies the site and the restricting conditions under which the building is to proceed. He must know very accurately how much money is available, and if the client wants more than he is willing to pay for he must insist firmly that the impossible cannot be done. He has learned through years of study and training how to plan so as to secure maximum convenience and maximum efficiency in room, lighting and ventilation, and maximum beauty in appearance. To accomplish just this in his profession. It is more than a trade—it is an art. When plans are made and specifications written, the entire building has been built on paper completely. The well-trained planner foresees the little things, the odds and ends, and incorporates all of them in his paper building. In addition to the practical and utilitarian features for which he is constantly on the lookout, and which he is storing up in his mind, his knowledge of architectural history and all the allied arts enables him to dispose of rooms and units and features in an orderly and therefore a beautiful way.

With the building designed and the plans made, his work is only begun. He must now execute these plans with the help of other men, who very often are men without initiative and without imagination, who must be constantly directed and watched. Disputes cannot arise if specifications and drawings are clear and if the owner understands both intimately. But if disputes arise, the architect has the legal knowledge required to make settlements. The work of the several trades must be done at such times and in such ways as to bring about the quickest and best results as a whole. The constant inspection of materials and workmanship and the rejection of defective parts give the owner a large guarantee which he would not have if such inspection were left to the interested

*Architect, Corbett building, Portland, Oregon.

contractor. This is not meant to reflect upon the contractor's integrity, or to discount the importance of his contribution to building operations. By the terms of the contract the architect's decision is final in most cases, and the contractor recognizes his knowledge and authority. The architect supervises payments, issuing certificates which are statements of work accepted, and accounts for all funds expended until the job is completed.

Now, these services have a very real value to the owner, and very often represent an actual saving over and above the architect's commission. This commission is usually made a percentage based upon the cost of the completed building including permanent fixtures. The amount of the commission does not represent clear profit for the architect, for he must hire the services of engineers, draughtsmen, superintendents, stenographers, and blueprinters, and pay other overhead expenses. It often happens, in residence work in particular, that the architect's commission is actually not sufficient to pay for expensive changes in the drawings for which only the owner is responsible. Many people recognize the architect, but have unknowingly employed as an architect a man who is quite a different individual, with no claim whatsoever to the title. Then, after a bitter experience—a disappointment in plans and costs—friends are advised to avoid architects. This is a situation manifestly unfortunate both for the prospective builder and for the man who can best serve him.

There are, of course, incompetent architects, just as there are incompetent lawyers and doctors. Ability and integrity are fundamental. But it should be remembered first, that the results of an architect's incompetency are permanently evident, while those of a lawyer or doctor are hidden in the mysteries of the law or of the human body; and second, that a client's interest and commendable pride in his building is no greater than that of his architect in whose mind the structure is conceived.

* * *

Responding Electric Push Button

A consular report states that an electric push button devised to indicate a return signal has been invented by a Norwegian electrician. The apparatus is a very simple contrivance which can be attached at a slight cost to any push button connected with an electric bell.

By means of an electric magnet, directly behind the signal button, a dull buzzing sound makes known whether the person called is present. Besides assuring the one signaling that he has been heard, it will save the one called the annoyance of listening to repeated ringings. The appliance can be used in connection with call buttons in hotels, shops or other places where the employee called cannot always immediately respond by his presence.

* * *

Vacuum, Everywhere

There is a theatrical magnate in New York who is up on the needs of the tired business man, but a little bit shy on general education. In his office they were discussing the prevalent hard times—theatrical and otherwise.

"Well," he said, "there's one guy in this town that I envy. He's busy all the time. Everywhere I go I see people using his machines."

"Who's that?" inquired one of the company.

"Why, this guy Vacuum, that makes all them patent cleaners!"

A Message from the East

R. Clipston Sturgis, President of the American Institute of Architects, who recently paid a visit to California, has written a message to the Architects of the West, a message that is both picturesque in its description of local conditions and encouraging in its praises of things accomplished and possible future achievements. Mr. Sturgis prepared the following article at the request of this magazine, incorporating in the outline the gist of his several talks before the San Francisco and Los Angeles architects and contractors. In his address before the San Francisco Chapter, Mr. Sturgis told of his impressions upon first viewing the Dream City from the deck of the ferryboat—the Dream City veiled in mist—the vision realized. Here the East and the West work together. The West honored the East by entrusting to it the designing of some of the courts, and the West showed its ability in the marvellous beauty of the enclosure which forms the outer wall of these courts. It would be difficult to say, writes Mr. Sturgis, which is the more beautiful—all are wonderful works of imaginators. Together they make the perfect whole. Together they have realized what they never could accomplish alone. This spirit of co-operation, this fellowship is the keynote of the architect, is the keynote of the Institute, and of all for which it stands.

By R. CLIPSTON STURGIS, President A. I. A.

THE last quarter century has seen great changes in architecture; the architect can no longer stand alone and claim accomplishment. All his work that is worth anything is the work of many minds with a single aim. The Institute has changed with the architect. From being a small local organization it has grown to be a large professional body with its chapters covering the whole country. The fine, generous unselfish work of the past was done by a few earnest disinterested men, who had a vision of what the future might hold. The work today is done and must be done in the same spirit, but it must now be representative. It is far more difficult, but the results should be even better than those reached by the men who led the way. They can be so only if we follow humbly in their footsteps and work disinterestedly for the general good. The Institute's strongest claim to recognition is that its work is unselfish. When this is true and when it is recognized the profession will always gain a hearing and generally accomplish its work.

Two examples out of many are the Missouri State Capitol competition and the hearings at Washington before the Commission on Public Buildings and Grounds. In Missouri the Commissioners had published a program for a competition. It was not a fair one and it did not seem to promise well for the selection by the state of the best architect. The Institute offered its service to improve the conditions and the offer was declined at first and then somewhat grudgingly accepted. Three men of the Institute Standing Committee on Competitions went to St. Louis and in the first hour's talk convinced the Commission that their action was entirely disinterested; that they neither wished to take part themselves, nor in any way to confine the competition to members of the Institute. The Commission then listened with care to the arguments, withdrew the program which had already been printed and widely distributed and accepted by over sixty architects and issued a new program on the lines advised. The competition was a success and the Institute was warmly thanked by the Commissioners for the help given them at a critical time.

The hearings at Washington were for the consideration of a report made by a special committee appointed to study and report on execution of public buildings. Three cabinet officers and two members each from the Senate and House composed the committee. The Secretary of the Treasury signed the majority report; the Postmaster General the minority, and the Attorney General declined to sign either. The Board of Directors of the Institute, believing that the minority report showed thoughtful understanding of the problems involved in postoffices (the bulk of Government work), endorsed this report. It was thus that an opportunity was made for individuals of the Institute to appear unofficially before the Commission on

Public Buildings and Grounds which had this report under consideration. It was the same group of men which had repealed the Tarsney Act, men who were not friendly to architects and who rather distrusted them and wholly ignored them. When it was found that the architects were advising them as to the best method of standardizing the smaller buildings, buildings in which they could have no possible interest because they were always built by the supervising architect's office, they listened with interest and eventually asked the architects to rewrite their bill along the lines suggested in the conference.

Disinterested service is the great opportunity both of the individual architect and of the Institute. Yet even our own members disbelieve in the work the Institute endeavors honestly and faithfully to do, through its officers and its committees. One man writes that the Octagon, the busy center of all the activities of the Institute, is a clubhouse where a group of Eastern men meet and enjoy themselves. One would like to put such a man on the board and let him sit through two days' hard work in that same Octagon. Another from New Jersey wrote bitterly complaining that the old uniform agreement had been withdrawn and lightly, even cheerfully, condemned the painstaking, unselfish and thorough work which has produced the standard documents. The agreement and general conditions which replace the "uniform agreement" and represent five years' work of architects, builders and lawyers is thus casually condemned by an individual who one may guess never did a day's work in attempting to better conditions for the owner, the architect and the builder. The top-notch, however, was the letter from the man who complained of receiving a personal letter from the treasurer about his long-standing indebtedness. He claimed that no treasurer with a proper sense of what was right would send anything but a printed formal notice. The obvious inference being that the printed notice could go to the waste paper basket, but the letter demanded an answer.

The cure for discontent is work. The moment a man steps forward to bear his share and do his unselfish work for the general good he finds his reward in the work. The criticism of others is always easy, but to stand aside and criticize those who work is one of the easiest games in the world and one of the most useless.

The architect, above all other artists, is dependent on working with others; he must work with all sorts and conditions of men, and be prepared to trust them and co-operate with them.

Even among architects there will be varieties running from the artist to the builder, but all along the line each must fulfill his varying obligations if he is to retain the respect of the community where he works. The artist cannot excuse his executive disabilities under the shield of artistic temperament, nor can the incompetent find any place in the profession of architecture. Such men injure not themselves alone—this would be simply reaping what they sow—but they injure the profession, and this really matters.

The architect has a series of duties to perform to owner and builder and unless he acquits himself here with some credit he cannot command the respect of the public. To the owner the architect stands in the relation of a trustee, for the owner buys what the architect offers him and rarely knows whether or not he receives his money's worth. It is a matter of honor with the architect to give good service and to spend the owner's money to best advantage for the owner. The contractor looks to the architect for fair play, and the architect, paid by the owner, has a difficult task to perform. Often the questions he must decide concern the interpretation of his own drawings and specifications and he can choose between confessing his own errors or omissions and putting the expense on the owner, or bearing the expense himself, or getting the contractor

to bear it. If the latter course is followed he is next tempted to make it up to the contractor in some other way, and possibly at the expense of the owner. To the sub-contractor the architect has special obligations for often he is the only one who can see that there is fair play between the general contractor and his subs. Finally to the mechanics and laborers on the work, and to the organizations of these men the architect has duties.

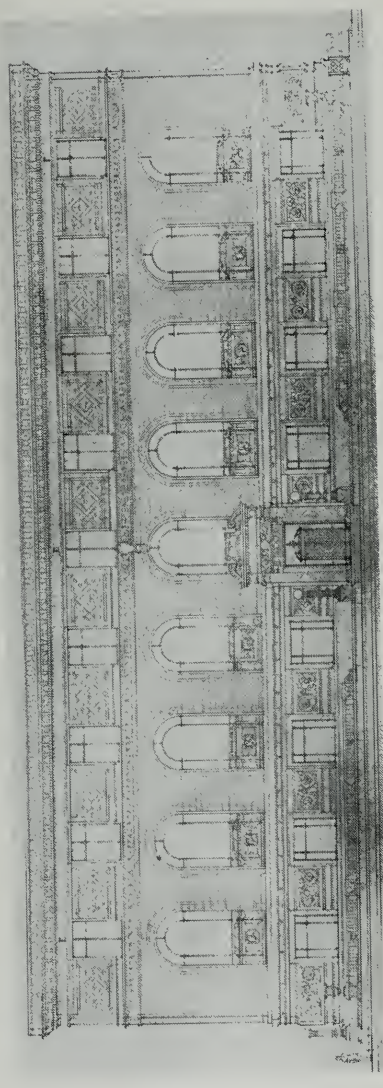
Only by performing creditably these services can the architect win the confidence and respect of his community and only then can he wield the influence which should be exercised by architecture—the universal art. We all know these things, but to put them into practice requires the strength of unions, we can set standards collectively which we can neither set nor maintain alone. This is what the Institute can do not for its members alone, but for the profession and for the public, and it needs the help of all to do its work even reasonably well.

It is worth while just to glance at the sort of things done in recent years. A competition circular of advice has been produced, the work of years of careful study on the part of a very large number of men, based on innumerable examples of competitions, good, bad and indifferent. Its aim is simply fair play. Competitions in school are for the good of the student; competitions in practice are for the benefit of the owner. They are not instituted to give the young and inexperienced a chance unless the owner is a public body, willing to gamble with public money. They are not instituted to give the incompetent a chance, but simply and solely to give the owner the best available architect for his building. The Institute makes four suggestions toward the accomplishment of this. First, it advises the owner to invite no one except men to any one of whom he would trust the execution of the work. Second, it advises having the program drawn by an architect who can express what the owner desires in terms the architect can understand. Third, it advises the owner to have the benefit of professional judgment in making the award. Fourth it suggests that as a matter of fair play the owner should agree definitely that he will employ the winner to do the work. This is what the Institute has done and through this circular has established better conditions for competitions throughout the country. The schedule has been established to give the professional judgment of the Institute on what really good architectural service is worth. It does not and cannot fit all conditions everywhere. The canons of ethics state briefly the things we all know, but that statement will help us to do what we know to be right. The new constitutions and by-laws are presented in the hope that it will enlarge and strengthen the chapters and the influence for good of the Institute. The Octagon was acquired largely through the generosity of individuals to give the Institute a permanent home and head-quarters for its many-sided work. It needs complete restoration, both of house and grounds and to do this should be our work and our pleasure. The measured drawings made by Glenn Brown are the first steps toward this. The Journal is another venture made possible through the aid of individuals.

This is the briefest sort of outline of the activities of the Institute. The influence of this active work should be far wider than it is. It can be increased only by the efforts of individuals to command the respect of all about them by upholding the ideals of honor, the ideals of duty and the ideals of service.

In this San Francisco has a great opportunity. Here at this time San Francisco has given the world the inspiration of a realized dream in the beauty and harmony of her Exposition buildings. Here East and West are as one. Here architect, painter and sculptor have worked in harmony; engineer and builder have contributed their share. One cannot look on the beauty of all this without feeling that poetry and music must also have lent their aid.

To San Francisco we turn for inspiration and help in placing the Institute where it belongs, as the leader in all matters connected with the most inclusive of all the arts—architecture.



FRONT ELEVATION, CARNEGIE LIBRARY, SACRAMENTO
AWARDED FIRST PRIZE, LORING P. RIXFORD, ARCHITECT

Photo, Courtesy of Sacramento Bee.

Good Concrete in Road Construction

By WM. B. GESTER, C. E.*

IN the little cloth leaved volumes with the brightly colored illustrations where so many of us took our first excursions into the realms of English literature, was a jingle which had for its subject a maiden possessed of a curling lock of hair which "hung low in the middle of her forehead." The location of the curl was undoubtedly immaterial except that it gave the fabricator of the stanza the opportunity of perpetrating a rather imperfect sort of rhyme and of describing the varying moods of the maiden, who

"When she was good, was very, very good,
But when she was bad, she was horrid."

This verse so correctly characterizes Portland cement concrete that we feel justified in thus taking a text from Mother Goose to caption a paragraph in a Technical Bulletin.

When concrete is properly constituted, properly handled and properly placed, it is of almost inestimable value as a construction material. In so far, however, as it lacks any one of these requisites, it is proportionately unsafe or even dangerously worthless. In none of the various fields of its use is this more true than in road and road structure work, and in this field its employment has increased with a rapidity that is marvelous. It is the accepted standard base for the asphaltic wearing or surface coats that modern road traffic demands, under certain conditions it is proving the most valuable material for both body and surface of roads and very steadily and rapidly its use is increasing for highway bridge construction.

The vast increase in the use of concrete has resulted in a corresponding increase in the numbers of concrete workers, too many of whom have not had the opportunity of learning the peculiarities of the material, nor the best methods of securing, in an economical manner, the best results. Millions of dollars have been expended, to not the best advantage because of these conditions, and millions more have been virtually entirely wasted. Millions of barrels of Portland cement are used every year without being tested and yet it is a most unwise, not to say dangerous practice. Men and corporations who know best never indulge in such chances. If we have any competent authority on the subject, it is the American Society of Civil Engineers. The very first condition or recommendation of this body in its specifications governing Portland cement is that **"all cement shall be tested."**

The most carefully managed corporations which are users of cement, the great railroads and the great cities of the country, insist upon the precaution. None are more careful in this regard than the great engineers of America, and yet in spite of the best authority and example, chances are taken every day that may and do result in lack of economy and in woeful waste, if not in dire disaster.

But it is not only in the matter of the cement that sufficient care is not exercised by many concrete makers to thoroughly satisfy the demands of economy and efficiency. It has fallen to the lot of the writer to make a great many examinations of faulty concrete in road and street pavements and in sidewalks, and with the facilities afforded by our laboratory to fix the cause of trouble.

In a very large proportion of these cases, the causes of inadequacy and sometimes of complete failure could not be ascribed to the quality

* Manager San Francisco Branch, Robert W. Hunt & Co.

of the cement employed but were proven beyond doubt to lie in the unfitness of the inert aggregate. Frequently where a large enough proportion of a good normal Portland cement was used to have made a satisfactory concrete, a weak easily raveled mass was the result, and examinations and analysis has proved the trouble to rest with the sand and gravel or stone. To altogether too many contractors sand is sand, gravel is gravel and broken stone is broken stone, no matter what its peculiar characteristics. It is true that more care is exercised than formerly in specifying whether each of these shall be constituted as to the percentages of particles of given size, but such specifications should be **always** provided and unfortunately they are not. Too often the requirements are simply that the mass shall be constituted (for example) of 1 part cement, 3 parts sand and 6 parts of gravel or crushed rock. Just how excellent for concrete purposes this mixture may be then depends upon a very important factor, the percentage of voids in the mixture of fine and coarse aggregates. Nothing of such supreme importance should be left to chance. Even when all the particles of the aggregate are hard and clean, the possible variation in this factor is altogether too great to ignore. The gravel or stone may contain so many smaller particles that a much stronger concrete may result in a mixture of 2 parts sand and 7 parts of the so-called gravel or rock.

A dissociation test made recently in our laboratory of a concrete specified as 1 part cement, 2 parts sand and 4 parts gravel proved that it was really 1 part cement, 4 parts sand and 2 parts gravel. The gravel used by the contractor contained so large a proportion of fine material that this was the result, and it was a very expensive result for the whole job was too weak to pass inspection and had to be done over. A comparatively very small expenditure for tests of the sand and gravel before using would have avoided this loss. The prevention would have been a matter of dollars; the cure was a matter of hundreds of dollars.

Frequently it happens too that local conditions are such that it is practically impossible to secure aggregates that will actually or even approximately fill the requirements of a closely drawn specification, and yet where it is to the interest of all parties concerned to make the best use of the material which can be readily and economically secured; in other words, where the specification should be so drawn as to make the most efficient use of the available materials.

It is not uncommon practice among conscientious and well intentioned contractors when they feel that their sand or gravel is not just what it should be to "put in a little more cement." This is an attempt to do things by "main strength," but it is not scientific. It is not accurate. It is not economical nor efficient. It is not the best way. The best way is to have the problem properly solved by a competent chemist, before the work is started. Contractors and engineers will find that such precaution and investigation will be not only of infinite value in the knowledge and consciousness that they are making the very best of existing conditions but they will also find that the cost of such precaution is comparatively a small cost in no way commensurate of its value to them in the actual saving of expenditure.

* * *

It All Depends

Examiner—Now, William, if a man can do one-fourth of a piece of work in two days, how long will he take to finish it?

William—Is it a contrac' job or is he workin' by the day?

ODD FELLOWS HALL, OAKLAND, CALIFORNIA
J. Henry Boehrer, Architect

The Odd Fellows Hall, Oakland, California

The Odd Fellows Hall, located on the north-west corner of 11th and Franklin streets, Oakland, is a four story, steel frame and concrete building and is 75 feet in height from the sidewalk to the top of the firewall. The design of the exterior of the building is an adaptation of the Italian Renaissance. The facade is red pressed brick laid up in flush white mortar joints embellished with white ornamental mat glazed terra cotta.

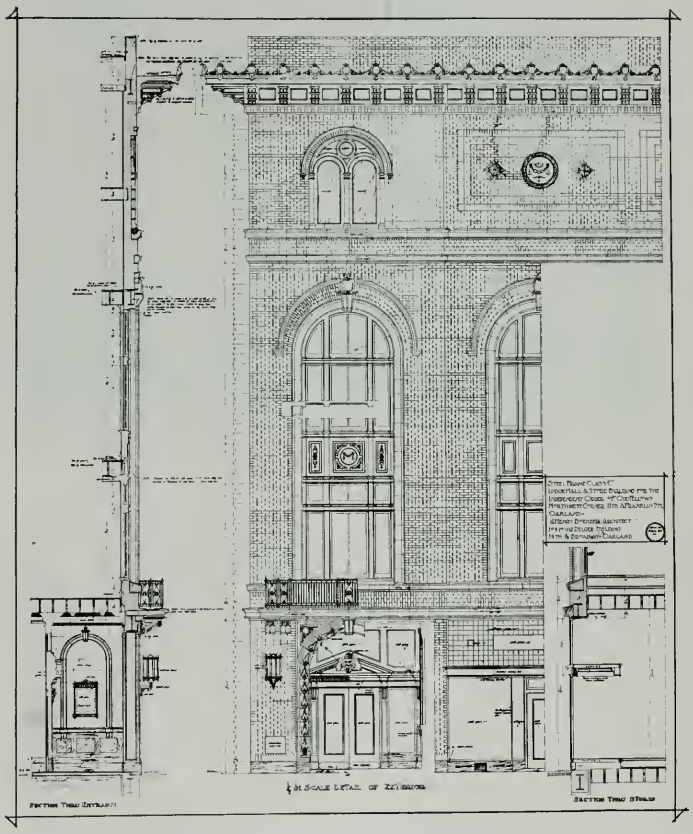
In the building there are three lodge halls, a banquet room, a ball room, a club room for the Odd Fellows, a club room for the Rebekahs, four stores and a basement under the entire building.

A rather interesting feature is that the lodge halls are entirely without windows or skylights, absolute quiet being most essential in these rooms. This necessitated a fully equipped force heating and ventilating plant, located on the roof and designed to entirely change the air in these rooms every 15 minutes.

The main lodge hall is located on the fourth floor and is lighted by indirect cove lighting with excellent results. The lights are concealed in an elaborate ornamental beam ceiling and are alternated in colors for different effects for the degree work of the Order.

The inside finish of the main lodge hall and furniture and the ball room is Jenesiro. The main lobby and vestibule are finished in quarter sawed oak, Caen stone marble, tile and mat glazed white terra cotta.

The building cost $100,000 complete, including furniture for the main lodge hall.

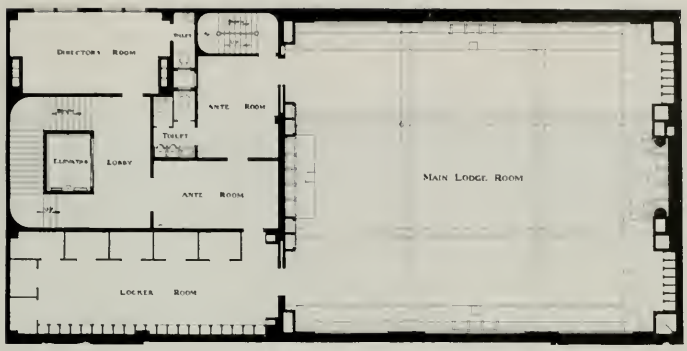


DETAIL OF EXTERIOR, ODD FELLOWS HALL
J. HENRY BOEHRER, ARCHITECT

ENTRANCE ODD FELLOW'S HALL, OAKLAND
J. HENRY BOEHRER, ARCHITECT

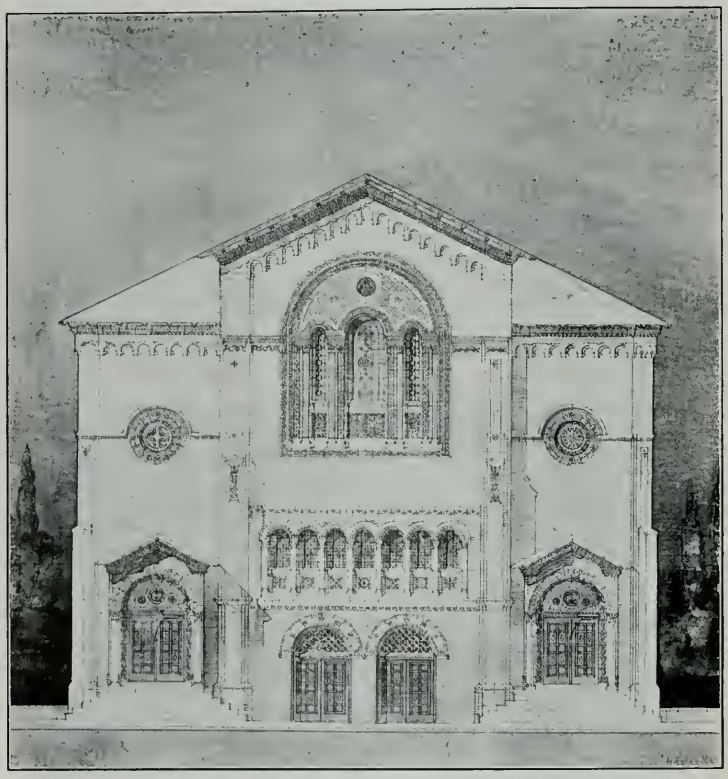
BANK, ODD FELLOW'S HALL, OAKLAND
J. Henry Boehrer, Architect

CLUB ROOM, ODD FELLOW'S HALL, OAKLAND
J. Henry Boehrer, Architect



FOURTH FLOOR PLAN, ODD FELLOW'S HALL, OAKLAND
J. Henry Bochrer, Architect

MAIN LODGE ROOM, ODD FELLOW'S HALL, OAKLAND
J. Henry Bochrer, Architect



THIRD CHURCH OF CHRIST, SCIENTIST, SAN FRANCISCO, CALIFORNIA
EDGAR MATHEWS, ARCHITECT

The Efficient Conduct of Building Operations*

By GRANT FEE.

ONE DEFINITION of Efficiency given in Webster's Dictionary is: "The ratio of useful work or the effect produced, to the energy expended in producing it."

We are not moving forward at the present time in the general sense of the word, but we are going by leaps and bounds. In the science of construction and in mechanics we are advancing at a rate which twenty-five years ago was not deemed possible.

The Woolworth Building, located in New York City, has a height of 792 feet, has 55 renting stories, with a floor space of 40 acres. This building was constructed complete in less than two years. This is an accomplishment which for gigantic proportions and economy of time well nigh staggers the imagination. The commercial value of a structure of this character is made possible by the invention and construction of high speed elevators with the necessary practical safety devices.

The Twin Peaks Tunnel, which is now being constructed in San Francisco, has a length of 2¼ miles, a width of 25 feet in the clear, and two large substations or chambers with necessary approaches. This work will be completed in less than two years.

The Panama-Pacific International Exposition has a total ground area of 635 acres; of this 330 acres are covered with buildings, or are under roof. In its construction over 110,000,000 feet of lumber, over 120,000 tons of steel, thousands upon thousands of tons of plaster and other materials in proportion were used, together with the salt water fire system, the fresh water system, the sewer system, the electric system, the streets and driveways, and the parking and planting; the grading for streets was commenced in October, 1912, and all work was completed in February, 1915, making the time for completing this gigantic undertaking less than two years and five months.

In the construction of the Panama Canal, the most gigantic undertaking in the world, over 200,000,000 cu. yds. of earth and rock were removed; 5,000,000 cu. yds. of concrete were employed and half gates in the locks were used which have a weight of 700 tons each. This Canal was completed in ten years and eight months by the United States Government. To perform this work special appliances and machinery were designed by General Geo. D. Goethals, who had complete charge of the entire work; he is the greatest American builder today, and it was Gen. Goethals who made this very celebration possible. It is our loss that it was not possible for him to accept our invitation to be present with the American builders during this Congress.

These are forcible illustrations of modern efficient building methods.

In mechanical lines, new machinery to perform new work is being designed and constructed so rapidly that efficient machines of last year are inefficient this year, due to other better inventions or the urgent necessity for new methods.

Referring to the building industry in particular, the invention of machinery and appliances for the direct and economical manufacture of the various articles necessary to construct a building, and for conducting the actual building operations on the site, have resulted in increased efficiency to such an extent that at the present day a building can be, and is, constructed in a much shorter period than would have been required even twenty years ago.

* Paper read during American Builders Week, San Francisco, October 18-23.

The wonderful possibilities of these days for manufacturing the hundred and one materials which enter into the construction of a building, enable us to perform all work in shops or factories, excepting the actual erecting or assembling of such materials on the site, thereby effecting much saving of time, which today means money.

The economic value of modern construction hoists and elevators, mechanical mixers for various materials, pneumatic tools for riveting, drilling and boring, the use of electric power and electricity for welding and cutting, power saws, power surfacing machines, swing staging for exterior work, preservative coatings to stone for excluding moisture, thus making stone work look better and last longer, the making of concrete practically watertight by the admixture of hydrated lime and waterproofing compounds, and the thousand and one machines, compounds and materials, which have been invented for various uses, all combine toward increased efficiency to make it possible to construct a building quicker and better than ever before.

The revolution of construction methods by the introduction of the modern steel frame, reinforced concrete frames, reinforced concrete for wall and floor construction, mill construction and other methods, all tending toward increased fire protection, are other forms of greater efficiency.

The improvements made in the past twenty years in our factories, now well lighted and sanitary, and in our shops on the building site, essential to the health and comfort of workmen, as well as in the mechanical part of the construction of buildings, are marvelous.

When quite a boy I was taken into the woods by my father to fell trees; from these we hewed the timbers with which to construct dwellings and barns the following season. These timbers were framed in the woods at times, and at other times hauled to the yard and framed, and in the summer season erected, enclosed, and the building completed. It was during the winter season we made the doors, sash and various parts of the finish in the shop and entirely by hand. The manual or physical energy expended on buildings constructed in this manner was naturally much greater than the same kind of energy expended in constructing such buildings today. Now, timber is sawed, sash, doors and finish of all classes are manufactured by machinery, with cutting and shaping tools of the greatest efficiency. I can well remember later working on buildings where materials such as stone and iron were hoisted by the hand derrick. At the present time, excepting in isolated cases, hand derricks are obsolete, and those operated by electricity or steam do all such hoisting work, a simple yet forcible illustration of modern efficient methods.

The efficiency expert of today employed by a manufacturer to go through his factory, study its workings, in the hope of increasing its output with the same or less expense, does not enter the factory with the idea of causing the employees to expend more personal energy in order to increase the output, but with the idea of studying the various operations of the factory, locations of machines, etc. In other words, his aim is mainly to save waste, to introduce a system and arrange the machinery in a manner so that the energy expended by the employees is always expended toward greater efficiency or better production and not in unnecessary motions, or similar unproductive labor. It is simply an effort to save waste of time, materials and energy.

There is too much apathy in our business. We should inform ourselves, as far as possible. Let every man in the business read the excellent Building Trade papers of today. There is something to learn *every* day. Why should not education supplement the trades we learned when young? The

world does not remain still, men cannot afford to do so. If we do not progress we go backward, and it is our duty to keep abreast with the advancing strides in building matters and modern methods.

Now let us consider for a moment a very important question: Have we made the same progress in that part of our work which is non-mechanical—for example, Estimating?

We have not, in my judgment, made any material progress in the Efficiency of estimating for the past twenty years, perhaps longer. Our present method of obtaining contracts is much the same as it was twenty years ago, and I believe we could go much farther back than that.

No matter how many men or firms are figuring a building, each takes off his own quantities and figures accordingly, and here it may be said the time allowed for determining the value of work is now, generally speaking, too short. Some one has said accuracy is too often sacrificed for speed. Present methods are conducive to error, and resulting complications. Estimating as it is now done entails an immense amount of wasted time and energy, as one individual could take off the quantities ready for pricing, whereas twenty, perhaps, are doing the same work, all going over the same ground. The builder in the various lines wastes a great deal of his own time, and the time of men in his employ in taking off quantities for estimating. If this wasted time and energy could be devoted to supervising actual construction work on hand, it would be much better from the standpoint of efficiency, and incidentally, profit. The builder may not add a particular item for the wasted time and energy in an estimate, but in the overhead cost of the various buildings he does; it becomes a serious item of office expense, and therefore, must be, and is, paid for eventually by the owners, although under our present methods he may never realize this fact.

It appears to me that we are wanting in efficient methods in this particular. Owners may pay in the end many times over for taking off the quantities of a building; this would not be the case if one well-trained person were to take such quantities off, and duplicate lists of these quantities furnished to each bidder as a uniform basis upon which to figure.

This would help to reduce the cost of construction in the sense that a builder would be able to devote more time to the work he has in actual progress. He would have more time and a clearer mind with which to consider the numerous questions which always arise in carrying out work; greater efficiency and less waste would result.

It would seem to me, therefore, the creation of the office of Quantity Surveyor, licensed by the State, is desirable—a man who has special training in this work and who is responsible and competent. The plans and specifications would pass into his hands from the architect. His duty would be to prepare a Bill of Quantities of the various materials required for the construction of the building; this Bill of Quantities, with the plans and specifications to be submitted to the various bidders who are to figure the work; the plans and specifications to indicate the conditions under which construction will take place, height of building, character of work, etc., and the Bills of Quantities to indicate the quantity of material of all kinds which the successful bidder is expected to furnish. The Bill of Quantities I consider should be made the basis of the contract entered into between the builder and the owner; should more materials be required, the builder to be paid for same at his own unit rate, and if less materials are required, then same to be deducted from the contract at the unit rate. Would this not result in a great saving of energy and time now wasted, and result in a better understanding between all parties?

This would require plans from the architect more complete than those generally furnished at the present time for estimating. It would require plans showing the locations, sizes, etc., of all electric conduits, heating, gas, sewer, plumbing, vacuum cleaning pipes, etc. It would be necessary for plans to show the actual construction contemplated in various parts of the building, not leaving such matters to the judgment of the builder when estimating, and to the interpretation of an architect after a contract is awarded.

At the present time when estimating, a bidder must make some allowance for conditions and things not clearly shown by plans and specifications, thereby adding a certain cost to the building under our system. Were this element of risk or guesswork eliminated it would have a still further tendency to reduce cost of construction to the owner, and the builder would not be called upon to take those unfair chances which make bidding so uncertain today.

Payment according to measurement is nothing new; it has been used in older countries for a hundred years nearly. Mr. G. Alexander Wright, a prominent architect of this city, has, during the past twenty years, done considerable work in an attempt to establish better estimating and contract methods, urging and advocating better and fairer methods and the adoption of the Quantity System of estimating, upon which he is a well-known authority.

Some builders seem to be opposed to change in our system, taking the position if changed any one from a candlestick maker could become a contractor; therefore, the business would be over-crowded and would not be a profitable business in which to engage. I believe they are mistaken. There is nothing to prevent that now, and, unfortunately, we know it does occur. It appears to me that profits are not the result of our system of estimating. I believe our system is responsible for the losses, because it is impossible for a bidder in the hurry generally necessary in taking off quantities to accurately and intelligently do such work, for several reasons, consequently he must use his building instinct and judgment to guess "right" in greater or less degree in making up his estimate, and it is through resulting errors and by omitting quantities altogether, that losses occur.

The great variation in figures submitted for buildings, in my judgment, is due, not to the unit prices used, but rather to the difference in the quantities each bidder takes off. This variation in quantities is due in part to work not being shown with sufficient clearness on plans, and in part to the difference in the judgment of the various men taking off quantities, time being usually too short, and consequently, under our present unscientific, inefficient methods of estimating there must be more or less guessing as to the quantity of materials required.

The profit in building, when there is any, is due rather to the ability of the builder to buy materials at the best market price and to his efficient methods in conducting his operations and managing his business.

I believe the quantity system, or some method of payment based on the quantity of work actually executed, would make the business more profitable to the builder, less costly, and therefore a better investment for the owner. As I view the situation today, our estimating methods are unscientific and inefficient, and a change is necessary if we really desire efficiency in the estimating department of our business. I believe that it is the duty of every building organization in the United States to make a concerted effort to correct the present unsatisfactory contracting conditions.

Gentlemen, in conclusion, organization promotes efficiency. This gathering of the builders of this great Nation should not be allowed to pass

without an effort at permanent organization, an Annual American Builders' Week. By permanent organization is meant organization which recognizes our frailties as well as our virtues. When considering any question we should always consider how it can best be made a benefit to the community in which we live, as well as to our individual selves.

* * *

Steel Over Two Thousand Years Old

AT a recent meeting of the Faraday Society of England, Sir Robert A. Hadfield, the president of the Society, in speaking on the subject of "The Hardening of Metals," which was the general topic of the meeting, showed a specimen of steel which he offered as probably the first to be exhibited in modern times of an ancient piece of high carbon steel which had been hardened by quenching. The analysis was as follows:

	Per Cent
Carbon	0.700
Silicia	0.040
Sulphur	0.008
Phosphorus	0.020
Manganese	0.020
Iron	99.500

In describing it Mr. Hadfield said:

It was possible to obtain a fracture of the specimen, which weighed about 8 oz., was 3 in. in length, 2½ in. in width, ½ in. in thickness. This showed fine crystalline but rather brittle structure. After removing the scale the Brinell ball hardness number was found to be 146. On sawing the specimen in two there was found to be a quite fair proportion of the original metal still unoxidized. I received this specimen a few months ago from the superintendent of archaeology in Western India, Mr. Bhandarkar.

One of the special points is that, notwithstanding the large number of specimens of ancient iron and supposed steel I have examined the last few years, none of them have contained sufficient carbon to be termed steel in our modern-time meaning. This specimen, as will be seen from the above analysis, contains as much as 0.70 per cent carbon, which indicates that it can be readily hardened by heating and quenching in water. In other words, this material has been in its present condition for probably more than 2,000 years, and now, after being heated and quenched, hardens exactly as if it had been made only yesterday, thus showing that in this long interval and beyond surface oxidation, this specimen has undergone no secular change of structure, or alteration in the well-known capacity of an alloy of iron with carbon to become suddenly possessed of glass-scratching hardness after being heated and quenched in water or other cooling medium.

The photomicrograph of the material in the original condition shows that though variable in structure, and ranging in carbon from about 0.30 to 0.75 per cent., this is of pearlitic type, existing in both lamellar and sorbitic form. The crystallization varies from fine to coarse. In places the structure is blued, as a result probably of mechanical work. There are seams of slag in certain portions, but apart from these the material appears to be of similar type to ordinary modern carbon steel. After quenching from 850 degrees C. in water the steel readily scratches glass and under the microscope reveals the expected martensitic structure.

Mr. Bhandarkar assures me there is not the slightest doubt about the antiquity of this specimen from the bars found beneath the stone pillar of Heliodorus at Besnagar, India. It was found at the bottom of the pillar, dating back to about 125 B. C.

The Architectural Side of City Planning*

By GEO. B. FORD

THE World's Fair in Chicago in 1893 was an object lesson to all who saw it, of the wonderful possibilities of architectural grouping and setting. So deep was the impression that many on returning to their homes began wondering whether something of the same effect might not be secured in their own local public buildings. From this started the movement for "Civic Centers" which has been bearing fruit in so many of our cities. It is this movement that has given voice to the slogan, "The City Beautiful." As this work progressed people began to think, and the more broadly they thought about the development of their cities the more they came to feel that the "City Beautiful" alone was only a small part of the matter; that rather the construction of all phases of the physical city should be considered as a unit; that the city should be so planned that its work and its play, that city living should be as safe, healthful, convenient and agreeable as proper planning could make it. Then a peculiar thing happened. The social and economic interest in city planning became so strong that the pendulum swung to the opposite extreme and soon almost no one dared mention the term "City Beautiful." People almost lost sight of the architectural side of city planning. They failed to appreciate that what is economically and socially good may be aesthetically shocking; that the offense to the senses may more than outweigh the gain in well being.

Now the citizens are waking up to the fact that once a plan is satisfactory from the standpoint of business efficiency and social welfare, it need cost little if any more to make it pleasing to the eye as well. Many are feeling that oftentimes it is worth while to sacrifice a little of the other elements in order to gain in beauty. The pendulum is swinging back to normal. Comprehensive, all-around city planning is arriving.

Beauty is not something that is just applied after the plans are worked out. Beauty is more than skin deep. It must go back to the inception of the plan. At all stages beauty should be considered as well as utility. We can all understand utility, but while most of us appreciate beauty when we see it, few of us can analyze a pleasing effect and tell wherein its charm really lies. Architecture or better "Civic Design," as it is often called when speaking of civic architecture, is generally considered a rather mysterious subject, a subject to be left for its creation to the initiated few. The existence of such a feeling is most unfortunate. The sooner that illusion can be cleared away and the principles underlying good civic design are generally understood, the more insistent and general and therefore the more effective, will become a popular demand for seemliness in our cities. To this end we will try to present the major principles of civic design, illustrating them from well-known examples. From the first we find that the only difference between architecture and civic design is one of degree and application. In both cases the eye is satisfied by the use of good taste in mass, proportion, placing of ornament, scale, appropriateness, and the handling of color and materials. These are the same phases of design that run through all art, from the study of the setting for a jewel to the laying out of a great world's fair group. For each kind of work the principles have their different technical application, but they themselves remain the same.

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For example, the Union Station in Washington is very good in mass; the North Station in Boston is very bad. In the Washington Station the great central portion with its three great arches, the lower side wings with their lower arches and columns and the great approach all hang together in perfect unity. In the Boston Station, however, the opposite is true. No two parts of the facade hang together. The total effect is chaos. The mass is bad.

Again, why is it that every one is charmed by that perfect architectural gem, the New York City Hall, and at the same time is left cold by the Postoffice Building in front of it and by the Old Court House behind it? The City Hall could hardly be improved on in its proportions, while the proportions of the various motifs in the Court House and Postoffice are crude and unprepossessing. Good proportions in the design of any civic structure mean that the eye will be satisfied and the prospect remembered with pleasure.

The placing and distribution of details, their amount and kind is all important. The Pan-American Union Building in Washington is very happy in the disposition of details on its facade and in the arrangement of architectural features in its setting, such as the terraces, balustrades, steps, pedestals, etc. The same is true of the placing of architectural and sculptural features in the approach to the library of Columbia University. A splendid opportunity for good civic decoration can be wasted by the erection of a monument so unhappy in the spotting of its details as that in the "Square" at Cleveland, Ohio.

Scale is a highly technical matter and very hard to sense. A building or any civic structure is in scale when a man standing just in front of it appears to be man-size in relation to the structure. Most of the Gothic cathedrals of Europe are in excellent scale, but when you see a man in St. Peter's in Rome he appears like a pigmy. The building is too large in scale. All of the motifs and decorations are exaggerated to the verge of clumsiness. If the scale is too small a structure is apt to appear trivial. If the scale is too large it tends to become oppressive.

The appropriateness of the design of a structure to its function is a matter on which every one has his own views. Many question whether the heavy classic architectural treatment of the Pennsylvania Station in New York is peculiarly suited to the needs of the great modern terminal. There is a distinct demand for a monumental treatment in order to make it a worthy entrance to a great city, but it is a debatable point whether a more open treatment would not have given a greater sense of the movement of a city's crowds. On the other hand, the modern factory building with its walls of glass, its construction strongly accused, its elimination of all superfluous features is the acme of appropriateness. Such crudeness of suitability to use would rarely do in civic structures, for these must represent all the dignity of the city government. A certain sacrifice of the useful to the monumental becomes part of appropriateness in civic design.

Attention to the possibilities of texture of surface and of materials is something that we have not carried as far in America as they have in Europe. We have become used to the red pressed brick facade with its rock-faced granite trimmings and its painted iron cornice. Yet what a far cry from that to the beautiful texture and use of material in the Morgan Library in New York, in the Wisconsin State Capitol or in some of the recent suburban stations about New York, as in Yonkers, White Plains and along the West Chester and Boston Road. For the same cost, good

taste in the use of material and in the texture of surfaces can make a great difference in the appearance of a structure.

The recent use of color in architecture in our expositions, particularly in the wonderful color effects which are now to be seen at San Francisco, has opened our eyes to new possibilities in this field. We are afraid of color, especially in our civic architecture. We excuse ourselves by saying that it is "undignified." The real reason is that we do not trust ourselves to use it. But in view of the present ease and cheapness with which colored terra cotta and colored cement can be made, I believe that our cities are not bound to remain much longer sombre, drab and monotonous. The possibilities of the use of color are limitless and I prophesy an early demand to have our cities brightened up.

In analyzing the principles of civic design, most of the examples I have used are architectural because so few good examples of civic design as such are available. The same principles apply, however, in both cases; the same reasons exist in both cases for applying them.

It is charm of appearance that makes us proud of our city. It is that that should justify us in spreading the tale wherever we travel of what a wonderful city it is. It is beauty of prospect and of buildings that first catches the stranger's eye and suggests to him the thought that it might be well to come and take up his lot with us. It is only after such a first impression that he begins to think seriously about the practical things that make up a city plan. We must have beauty too. The full expression of the best that is within us demands it.

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Architects and Modern Construction

THERE are many architects who look upon modern construction as coming more within the scope of the civil engineer than within their own sphere, says a writer in The London Builder, and in consequence they neglect to study seriously this important branch of architecture. All classes of construction should undoubtedly come within the architect's curriculum, because it is only by having a thorough knowledge of this subject that he can design efficiently and economically, and thus do his duty to his clients. Generally speaking, the subject is studied casually, and the simple forms only are mastered, such as will obtain in ordinary domestic buildings, but when the question of scientific construction in large buildings of a modern type or investigation of the properties of materials comes into view, then the architect is inclined to feel that he can proceed no farther unless he intends to specialize in this particular subject. It is a well-known fact that the scope of an architect's training is a very large one, and many years of very hard study and practical experience are necessary to equip him sufficiently for his duties; but it is also obvious that the study of construction is seldom treated with sufficient importance by the average architect. Upon reading the results of the Intermediate and Final Examinations held by the Royal Institute of British Architects it will invariably be found that the percentage of failures in constructural subjects is greater than that in any other, and this indicates either lack of interest or insufficient study, or probably both, the student in many cases hoping that he will be able to "scrape" through his examination and put certain letters after his name. He does not appreciate the fact that the proper study and interest of construction will be of great assistance to him in later years, and it is included in his Examination syllabus for this reason.

Generally speaking, it is architectural design which possesses the great-

est fascination for architects, and they desire to see their taste and ideas embodied in the treatment of a building; but, having prepared a drawing on paper expressing their ideas, they are often quite content to leave the actual responsibility for the realization in other hands. It is, however, impossible to dissociate design and construction in this manner, as all successful design must necessarily take into account the nature and limitations of the various materials to be used; and it will always be found that any work which does not satisfy the spectator as being constructionally sound is equally unsatisfactory as regards artistic design.

There are a certain number of persons who are born designers, and they have a special genius for producing designs which are of the highest merit, while it is impossible for them to carry them out without assistance as to construction; but, generally speaking, a good knowledge of construction can be acquired by anyone if sufficient time is devoted to theoretical and practical study. In design, the question of individual taste will always be an important factor, and what is pleasing to one designer will possibly be rejected by another; whereas in construction the student has to deal with actual facts of strength, lasting qualities, and economy; and the principles of good construction of all kinds should be thoroughly mastered before any attempt at designing is made. The architect should always keep up with the times and study modern methods of construction, as it is only in this way that new types can be applied to produce true architectural effect, no designer who is without knowledge and sympathy with the material being able to evolve the best work.

Architects must realize that the client is interested in the actual structure as executed, and, although the architectural effect produced will be an important factor, the sound construction and lasting qualities will be the primary consideration to him, and, from a business point of view, it is necessary that the client should be satisfied and pleased not only at the time of completion, but also after several years have passed. The architect is responsible for the adoption of the various materials used, and also for the manner in which the work is executed, and unless he possesses a good knowledge of building construction he cannot fulfill his functions in a proper manner. The architect is retained by the client, not only to prepare designs, but also to see that the work is carried out in a satisfactory way, and it behooves every architect to direct and supervise the building under his charge in such a manner that the client gets sound construction, and in many cases the necessary knowledge and training are lacking. In the case of large buildings, where the construction is of a complicated nature and a tremendous amount of work is involved in the calculations and preparation of the necessary drawings, it is quite natural and proper that a consulting engineer is employed to work in conjunction with the architect; but the latter should, at the same time, possess sufficient knowledge to be able to discuss the various problems intelligently, and he should retain his position as the chief agent of the client and be responsible for the actual structure. There is a great tendency, however, to shirk this responsibility, and even in small buildings it is a general thing for architects to give the calculations and preparation of the steel and other constructural drawings into the hands of firms whose interest is to make a profit on the work.

How many architects are able to design the constructional steelwork for their own buildings? Very few indeed, and the consequence is that they are absolutely in the hands of the merchants who supply the material, and this despite the fact that the architect is the responsible person, and no guarantee given by the person supplying the material can release him from that

responsibility. Steelwork construction should be studied by the architect, and he should be competent to design and check same, as it enters largely into modern construction, and it is his duty to give size and details of all parts of a structure for which he is paid to design and supervise. Failing the employment of a competent independent engineer to do the work for him, he is likely to get too much or too little steel in the building, for which his client pays, in accordance with his methods of obtaining schemes from merchants without or with competition. What applies to steelwork applies also to other constructional materials, and it is absolutely essential for a competent architect to be thoroughly trained in building construction.

The modern developments are all on the lines of more scientific methods, and perhaps the most striking example of this is provided in the extensive use of reinforced concrete during recent years; and yet there are very few architects who have attempted to take up the proper study of this material in order that they may be able to check the specialist working under him, or design typical portions of a structure for his own guidance when preparing the general architectural drawings. This state of affairs is to be regretted, and it is this attitude of the architect to the many branches of his profession, apart from the purely artistic side, that has earned for him the reputation of being generally a poor man of business. The average client appears to be imbued with this idea also, and in many cases looks upon an architect's fees as excessive; whereas, if the work of designing, detailing, and supervising is properly carried out, an architect thoroughly earns his money.

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Loring P. Rixford Wins Sacramento Library Competition

LORING P. RIXFORD of San Francisco, winner of architectural competitions on a number of occasions, has been awarded first prize for his plans for a new Carnegie Library in Sacramento. The fact that the selection was made from fifty-six sets of drawings, submitted by as many leading architects throughout the Pacific Coast, makes the honor conferred upon Mr. Rixford the more noteworthy. The competition was open to any architect in good professional standing and was conducted under the rules of the American Institute of Architects. Mr. Rixford's scheme calls for two wings connected by a main stack, the height of the building being three stories. The style of architecture is Italian Renaissance. On the main floor will be the children's library and periodical rooms. The main reading room and delivery rooms occupy the second floor, while the third floor is devoted to special libraries, branch and school libraries.

The cost of the building is expected to run in the neighborhood of $100,000. There should be an additional $50,000 appropriated to insure carrying out the design without skimping.

The jury of award consisted of a member of the City Commission, the City Librarian and Edgar A. Mathews, the latter acting for the Institute. Five honorable mentions were made as follows: Bliss & Faville, Washington J. Miller, and John Baur of San Francisco, Corlett and Stillberg of Oakland and Withey & Davis of Los Angeles.

Mr. Rixford is the architect of the Bohemian Club building, San Francisco, which commission was also won by competition. Besides this Mr. Rixford won the competition for the Union Club building at Victoria, B. C., and for the Provincial Royal Jubilee Hospital located in British Columbia.

The Engineering Contractor*

By HALBERT P. GILLETTE, Editor "Engineering and Contracting."

ENGINEERING is the application of science to the problems of economic production. In so far as contracting is scientific, it is engineering. Engineering contracting, therefore, may be defined as the scientific building of structures and plants. In its more highly technical branches, engineering contracting requires the services of the trained engineer, and it then becomes an amalgamation of the profession of engineering with the business of contracting. But, as I conceive it, there are certain less technical branches of engineering contracting, in which the business part overshadows the engineering part. To cite instances of each kind, we have those contracting firms that design and construct reinforced concrete buildings. They are typical of the highly technical engineering contractor. We have firms that build roads, but do not design roads and do not themselves operate intricate plants. They are typical of the slightly technical engineering contractor.

There is, of course, no clear line of demarcation between the different classes of engineering contractors, nor is there a clearly marked line between the ordinary contractor and the engineering contractor. Here, as elsewhere in the realm of human activities, the classes merge into one another.

Evolution of the Engineering Contractor

With a steadily increasing number of graduates from engineering colleges, it became evident more than fifteen years ago that many engineers would be forced into the contracting business whether they wished to enter it or not. There were not enough purely professional vacancies for the rapidly increasing number of engineers. At about the same time a few engineers began to ask themselves whether they had not been taught to hold very narrow ideals as to what constituted engineering. They could see that all of engineering did not lie in the designing of engineering works, and they began a campaign of education the slogan of which may be said to have been: Engineers need business and business needs engineers.

I recall writing an editorial article many years ago in which I pointed out that there were 20,000 students enrolled in the engineering colleges of America and that the United States Census reports showed only 40,000 practicing engineers. The inference was that the time had come to urge most of the young engineers to cease looking forward to purely professional careers, but to begin planning to enter those lines of business and political administration that seemed to offer a chance to apply engineering knowledge effectively. Subsequently, both in books and articles, this theme received elaboration until our professors of engineering took it up. In several of the engineering colleges there now are courses designed to give engineers a training in accounting, management and general business practice.

The first branches of contracting in which engineers made a notable success were those that I have termed highly technical, such as structural steel and reinforced concrete work, hydro-electric plant design and construction, difficult foundations, etc. Where the work consisted mainly in handling men, and but to a minor degree in designing or selecting materials and plants, it was inevitable that engineers, trained as was then the custom, would make a less pronounced success. Perhaps it will always remain impossible for the average college educated engineer to equal the average self-

* A paper read October 19 at the American Builders' Week Convention, San Francisco.

educated contractor as a manager of "men in the rough." There is, without doubt, a great advantage in having "come up from the ranks" if one wishes not only to understand the men of the ranks, but to have their sympathy. It is for this reason that I formed my first contracting partnership with an experienced bridge foreman. And I have always advocated such a union of the trained engineer with the experienced manager of men, whether it be in a partnership or as co-officials of a contracting company. In the case of a successful partnership of this sort, each member of the firm is apt to attribute its success to himself. So the centrifugal force of their egotism often drives them apart, usually with ill effect upon their subsequent contracting careers.

While no statistics are available, I have but to look back twenty odd years to see a very marked increase in the percentage of engineers who have succeeded as engineering contractors. Contracting is, in many lines, a business full of hazard. Hence a large percentage of failures will be found, regardless of whether the contractor is an engineer or not. It is a business that calls for a sort of courage—"nerve," if you please—which relatively few men possess in the right degree. And usually it requires a man capable of standing constantly "in the trenches" without worrying unduly. In short, it is a peculiarly trying business, with its ups and downs, its superabundance of work and its scarcity of work, its spells of bad weather that knock out the profits and its spells of good weather that make work seem incessant.

One contracting friend of mine told me that he had finally devised a way that led him to be satisfied regardless of weather. "I have bought a farm," he said, "and when it rains I am happy because of the crops; and when there is a long dry spell I am also happy because of my grading jobs."

It was an engineering contractor, I believe, that invented, or at least popularized, the "cost plus a fixed sum" form of contract. Following his success in the hydraulic and building fields, other firms have devised various modifications of this form of contract. Others adhere to the old "percentage" contract, and on that basis handle large work not only throughout America, but in foreign countries. Probably it is such firms that are most commonly regarded as the typical engineering contractors, for they are not only officered in large part by engineers, but they employ large engineering staffs.

Science of Management

About sixteen years ago while in the midst of trouble from rising wages and rising prices that threatened to wipe out all prospective profits on certain contracts, I chanced to read Taylor's paper on "Shop Management." I saw that I could apply to my work some of the four principles advocated by him. My success in the application of two of the principles—unit timing and piece-rate payment—led me to conceive the idea of formulating a code of laws or principles of management derived from the experience of many men. Finally, I published some of these "laws" in condensed form and I called them part of a science of management. Hard upon their application there came a veritable flood of literature along the same lines—a flood that has progressively increased. Successful management must always have been scientific. But it had apparently not been realized that such a branch of knowledge as a science of management could be developed. Even yet there are those who deny the possibility of such an achievement. Yet, in spite of all the quackery that has attached itself to this science, there is abundant evidence that a true science of management is

being created, and largely through the efforts of engineers who have had experience as managers.

Obviously if such a thing as a science of management exists, or will exist, there will be an increasing percentage of engineers who will succeed in contracting and in other lines of business.

There was a time when only a few men, men of long experience, could be relied upon to design a bridge or locate a railway. Theirs was an art not reduced to printed rules—not a science. But eventually a science of strains and stresses was evolved, and with it came the ability to teach bridge designing so that comparatively inexperienced engineers were competent to design a more economic bridge than the most experienced rule of thumb engineer had ever designed.

Similarly, after Wellington reduced railway location to a science, railway location could be taught, and long experience was not so essential in the railway location as it had been. Thus, in fact, has each department of knowledge had its initial period when it was unsystematized and acquired mainly by personal experience, to be followed later by a systematizing and reduction, in large measure, to rules. So it is not to be wondered that even so intricate an art as management should eventually come to be analyzed and formulated, and thus pass by degrees into a true science. In the development of this new science of management the engineering contractor has been an important factor. He has been among the first, if not the first, to recognize the possibility of producing such a science, and has certainly done his share in adding to its literature. To mention but one phase of management, the recognition of the utility of unit costs as a means of securing economic work and the invention of methods of recording and analyzing unit costs, brings a realization of the worth of some of the literature that engineering contractors have written. This was a part of scientific management that Taylor entirely ignored in his "Shop Management," nor did he ever seem to see that there are many other principles of management than the four outlined by him in that paper—a paper that is indeed great in spite of its narrowness.

To apply the laws of management most successfully requires certain personal qualities, certain education and certain kinds of experience, to a brief consideration of which we may now pass.

Natural Qualities of the Most Successful Engineering Contractor

A somewhat extended acquaintance among contractors has given me opportunity to observe the most marked characteristics of those who have succeeded notably, as well as of those who have failed notably. "Grit," "nerve," courage—call the characteristic that makes a fighter what you will—is perhaps the most outstanding quality in the highly successful contractor. A mild, rabbit-like man has, I dare say, never succeeded as a contractor unless he has had discernment enough to attach himself to a fighting partner. The fighter is usually the leader, even in those walks of life where intellect is supposed to be supreme. I do not mean the quarrelsome man for whom trouble is a lodestone, I mean the man who makes "trouble" for those who have brought trouble upon him, the man whose backbone is not all wishbone. His is the sort of fighting spirit that flares up even after the sheriff has sold him out, the will-not-quit sort.

Next to courage is the quality that some call parsimony—a watchfulness as to the road the pennies are traveling. The successful contractor may bid in millions, but he camps on the cents. He may gamble, but after his bet is placed he lets no one filch the "pot" from him in driblets.

The third quality that distinguishes most successful contractors is their magnetic personality. They are "good mixers." They have a wide acquaintance and are on good footing with those with whom they deal. If luck frowns upon them, they do not lose temper and blame all losses on the engineer in charge of the work. Even when the engineer is largely to blame, they grin and try to let him see the fact without telling him so. The fighting spirit is strong in them, but stronger is the "horse sense" that tells them not to fight the engineer or the proprietor for whom they are doing the work.

I hardly know what to call the fourth quality of the successful contractor, for it is a composite of several qualities, some of which have already been named. It is, however, about 75 per cent integrity or honor of the sort that makes a banker feel that he is loaning money to a man who will not "welch" even if the opportunity offers and the incentive is strong. I have seen a good many contractors let their bondsmen finish their jobs and their bankers whistle for their money, but of such there are none to my knowledge that have subsequently succeeded in business. A banker is a pretty keen psychologist, as the popular expression for character reading now goes. If he sees symptoms of the "dead beat" in a man, there is speedily an end to that man's financial progress.

The successful contractor is himself a pretty good psychologist, even if he would not recognize his own picture under such a title. His natural proclivity as a "mixer" also implies a tendency to "size up" every man he meets. Is a man fat? Then he may be judicial, but he is probably not "scrappy" enough to make a good foreman. Does a man wear glasses? He may be a "shark" at figures, but is likely to be "shy" on the subtle art of getting jobs save by being the lowest bidder.

In addition to the five qualities just named, the most successful engineering contractors are usually gifted with an inventive faculty. They devise ways of accomplishing their results more economically than their competitors. Is it a dam? The standard design or the standard method of construction is not for them. They see a new and better way. They are the inventors of the rock-fill dam, the hydrauliced earth dam, and the hollow concrete dam. Is it a bridge across the East River? Then a great engineering contractor, John Roebling, invents—you may fairly call it so—the Brooklyn suspension bridge. Is it a pavement? Then an engineering contractor, Warren, invents bitulithic. Is it a building? Then an engineering contractor, Ransome, invents a twisted steel bar and a whole system of concrete reinforcement.

It would be a formidable task indeed to compile a list of engineering contractors who have won fame or fortune or both by virtue of their inventions of new types of structures and machines. Many there are whose names few of us know, although we use their machines. Who were the American contractors who invented the Fresno scraper, the "wheeler," the elevating grader, the power scraper, the rolling tamper, the gang rooter? What contractor first used a well driller, or cable drill, for blast hole work? Uncle Sam owes him a great debt of gratitude for the use of that type of drill on the rock work at Panama. If I am not mistaken his name is Kerbaugh, of Philadelphia. At any rate, I gave him that credit in print twelve years ago and no one has risen to claim priority.

So I might go on indicating the named and nameless contractors to whose ingenuity the world owes much. But my object is merely to call attention to one of the most important characteristics of successful contractors, namely inventiveness.

Education of Engineering Contractors

This I must pass over quickly. A broad engineering education, coupled with short courses in the law of contract, accounting and cost keeping, science of management, and engineering economics, should form the basis of any course designed for the engineering contractor. In many respects the present courses that lead to the degree of Mining Engineer more nearly meet the requirements than the present courses leading to the degree of Civil Engineer. But changes are being made in some of the civil engineering courses which tend to give much greater emphasis to the business side than has been the case in the past. If, coincidently therewith, civil engineering students are taught to be better "mixers" and are given some practice in the actual management of men, it may be possible, before long, to secure a civil engineering degree that will indicate a knowledge of something besides pure and applied mathematics.

Educators are almost unanimous in the belief that the chief object of an education is to teach a man how to think. But, I fear, the common conception of "how to think" is so narrow that it fails to embrace "how to deport oneself." How to act is quite as important in the business and professional world as how to think. A salesman may have a very fine thinking mechanism, but he will fill few orders if that be his sole characteristic. A rival salesman with a "think-tank" no bigger than a sardine can will beat him to death if he has a genial smile and a real spirit of good will back of the smile. Thinking is but half the game of life. Acting is the other and ofter more important half. Action is both a matter of heredity and a matter of acquired habit. A complete education should give a man habits as well as ideas and training in logic. The habit of going among men, the habit of studying their habits, the habit of being courageous, affable, honorable—these are things certainly not less important than a training in science. I fear they are, however, the very things that few educators have tried to cultivate in their students. The outstanding explanation of the excellence of the engineering training that West Pointers receive is the existence of a training in habits.

Reducing the Risk of Contracting

In closing this paper, I am going to depart somewhat from the field indicated by its title for I regard this as a time particularly opportune for a word as to the steps that should be taken to reduce the risks of contracting. A very great part of the risk is incident to the vagueness or the one-sidedness of contracts and specifications. Engineers aim to be fair—indeed I believe them, as a body, to be the fairest class of men—but unfortunately few of them have ever held the hot end of the contracting poker. At the cool end of the poker one can be astonishingly calm and critical; one can see how easy it should be to avoid blistering the hands. Just a little more foresight here, a trifle more agility there, and the ledger need not show up in the red.

But, engineers or contractors, we are all of much the same clay on this earth, and most of us will make much the same brick in the hereafter. It is useless to expect perfection, but occasionally we can try to move a few pegs nearer to it. Assembled together, we can discuss freely our respective troubles and their possible alleviations. I have long been hopeful that engineers engaged in designing and contractors engaged in construction would periodically meet to discuss such topics as: The Economic Size of Contracts, The Ratio of the Bond to the Size of the Contract, Bid bonds

vs. Certified Checks, Semi-Monthly vs. Monthly Payments, Full Payments vs, Fractional Payments for Work in Progress, "Kid" Inspectors, Bonus Payments for Speedy Completion, Time Extensions Dependent on Weather Conditions, Award of Contracts Prior to the "Building Season," Methods of Payment for Extra Work, Arbitration Clauses in Contracts, Specifying Results vs. Specifying Methods of Attaining Results, Percentage Contracts, "Cost Plus" Contracts, "Bonus" Contracts, etc. My pen tugs at the traces when I start jotting down the things that could and should be discussed jointly by engineers and contractors. I take this occasion to urge the desirability of bringing engineers and contractors together, locally as well as nationally, and at frequent intervals, that they may learn more of one another's points of view, of one another's difficulties. Recently a certain group of contractors formed a coalition to fight the acts of certain engineers. They had suffered, as they believed, injustices, and they were determined to go "higher up" for redress. I am not familiar with the details that culminated in the decision to "fight," but I am satisfied that a far better decision would have been a decision to "confer." Fights, whether before a court, or a commission, as a referee, are quite unsatisfactory methods of securing justice.

In conclusion it may be said that in spite of the ill effects of competition from uninformed bidders, there is a great and growing field for men who combine scientific knowledge with business ability, in brief for engineering contractors.

CALIFORNIA CONCORDIA COLLEGE, OAKLAND
Frederick D. Boese, Architect

WATER MEASURING DEVICES, UNIVERSITY STATE FARM DAVIS
(Used in experiments to determine the duty of water)

State and Federal Irrigation Work in California

THE accompanying plates are taken from the biennial report of the California State Department of Engineering, just published. They show what is being accomplished in permanent irrigation work and needed water development. Dams, ditches, waterways, etc., are being built and in practically every instance reinforced concrete has been used to insure permanency.

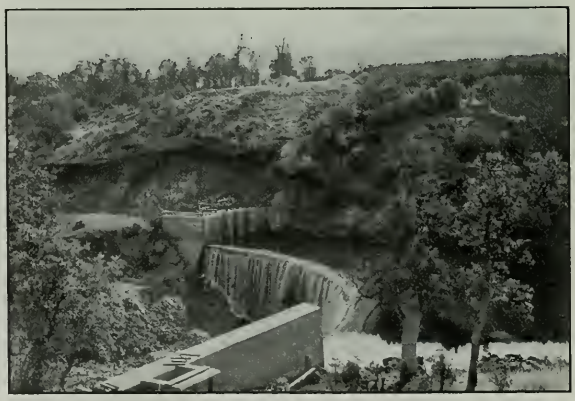
The report of Frank Adams, irrigation manager in charge, contains some interesting information pertaining to investigations conducted by the office of experiment stations, United States Department of Agriculture, in co-operation with the State of California.

The increase since 1912 in the irrigated area in Northern California, says Mr. Adams, has not been large, nor have any very extensive additional areas been brought under ditch during the past two years in that part of the state. The main construction improvements during the period have been on Cache and Stony creeks. On Cache Creek dams have been completed at Capay and at the outlet of Clear Lake near Lower Lake. Besides this, Adams Canal has been lined with concrete for a distance of two miles beginning at Capay dam. Winters Canal, on the opposite side of the creek, has been lined for a distance of 5 miles to the intake of Madison Canal. The Moore section of the Yolo system has been lined for a distance of about 3 miles, beginning about one mile below Moore Dam. Activities on Stony Creek have been confined to the Orland project of the Reclamation Service. Improvements on this project have mainly consisted in the building of a supply canal 6½ miles long to carry the drainage of Stony Creek to East Park Reservoir, which is located on Little Stony Creek. This additional water supply has made it possible to increase the area of this

CHECKGATE AT SIPHON SPILLWAY, EAST PARK RESERVOIR, ORLAND PROJECT, U. S. RECLAMATION SERVICE

project from 14,000 to 20,000 acres, the distribution system for which, with concrete structures, is now in course of construction.

There have been no large additions in Central California during the biennium but some progress has been made all along the line. The largest areas brought under ditch have been in South San Joaquin and Oakdale irrigation districts, both of which began delivering water through the new works in 1914. Both Modesto and Turlock irrigation districts continued permanent improvements on the upper works and Turlock District has constructed the Davis foothill reservoir. An irrigation district has been organized at Waterford, but no plans for a system have been adopted and



DIVERSION DAM, EAST PARK RESERVOIR, SUPPLY CANAL, ORLAND PROJECT, U. S. RECLAMATION SERVICE

IMPOUNDING DAM, CACHE CREEK, AT OUTLET

no construction begun. The chief interest around Merced and Madera has been the proposed organization of districts to take over the local system there. On the west side there has been much interest in irrigation from Tracy north, following the two dry years of 1912 and 1913. For a time

CAPAY DIVERTING DAM, YOLO WATER AND POWER COMPANY

there was much talk of an irrigation project for Tracy, Bethany and Byron, but the only definite accomplishment has been the organization of a co-operative company at Byron which proposes to build a pumping system for several thousand acres immediately about that place.

CONCRETE-LINED CANAL, YOLO WATER AND POWER COMPANY

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CO-OPERATION

American Builders Week recently held in San Francisco was not only a success educationally but from the view-point of co-operation and organization it was a revelation, an agreeable and complete surprise to many. Even allowing that the numbers of visitors from Eastern states were somewhat less than expected, this is accounted for by the fact that the celebration was held somewhat late in the season, and after thousands of Eastern builders had already visited the Exposition. On the other hand those who were present came because they were representative men in the business, others because they were not merely sightseers, but vitally interested in the problems which came up for consideration and discussion.

Mr. R. Clipston Sturgis, president of the American Institute of Architects, who was kind enough to accept the invitation of the general committee to speak upon the subject of "The American Builder," made a special trip from San Diego to San Francisco to be present at the congress. This was much appreciated. Mr. Sturgis, as is well known, is a polished speaker. His address upon this occasion also carried with it much practical wisdom, apart from being a plea for those better conditions which follow sincere co-operation and which are the key note of success. Mr. Sturgis was exceedingly apropos in his remarks, for the one thing above all others which seems to be directly necessary at this time in the building industry is co-operation, not only for the builder, but for the architect, and for all others engaged in the business. A unity of purpose is manifestly essential in securing the best results, and Mr. Sturgis hit the nail squarely on the head when he spoke of its great advantages. All successive ages have had their distinctive essentials or characteristics. The present time might well be called the co-operative age, or the age of organization, which is practically the same thing. Indications of its

effects or results surround us. Whether in design, in construction, or in the successful management of the completed structure the best results are to be obtained by this means.

Co-operation between the better type of architect and the better type of contractor cannot fail to promote a mutual respect one for the other, a better understanding, better methods, better buildings, and better results to the public whom they serve. Indeed, co-operation has been termed the father of Efficiency. Mr. Grant Fee, president of the Building Trades Employers Association of San Francisco, must have had this in mind when he gave his able address upon the efficient conduct of building operations before the American Builders Week Congress. Mr. Fee cleverly outlined some of the more important advances made in building efficiency methods, during the last twenty-five years. He took the opportunity, however, of contrasting the improved methods in mechanical lines to a want of corresponding progress in estimating and contract methods. The Architect and Engineer has in the past called attention to the necessity for a much needed improvement along these lines, and it is therefore encouraging to find so thoughtful and experienced a contractor boldly advocating such reform before a large and influential body of contractors, some form of payment according to measurement of the work to be done, some adaptation of the quantity system. Let a bill of quantities, said Mr. Fee, be the "basis" of the contract, in conjunction with the drawings and specifications; in short, let us do a fixed quantity of work for the contract price.

This principle, by the way, has always been advocated by the leaders of the movement which has now spread over the entire country in aid of better estimating methods, and which (like American Builders Week) also had its first inception in San Francisco, some twenty-five years ago.

On the whole, American Builders Week was a good idea, well planned and carried out. A good program of addresses and papers was provided and the committee in charge (which comprised representatives from over twenty organizations in the building industry of San Francisco) are to be congratulated upon the final result. The suggestion has already been made that American Builders Week should be perpetuated annually in different large cities throughout the country. We should be glad to see this done, as a means of placing the builder and the building industry properly before the public and upon a higher plane than hitherto. With co-operation among those interested this should now not be difficult of accomplishment. San Francisco has shown how it may be done.

G. ALEXANDER WRIGHT

ILLUMINATING A NATION

More than 13,000,000 persons so far have viewed the Panama-Pacific International Exposition in San Francisco. From every point of view it is the superlative World's Fair of history. Of all its achievements its greatest is Electricity.

The Exposition ends December 4th—this day closes Electrical Prosperity Week!

It is a graceful tribute to the electrical industry that the Exposition's distinguished president, Charles C. Moore, officially has designated its final days "Electrical Prosperity Week."

During this week the entire United States will reflect the unrivalled brilliancy the Exposition proclaims.

The lesson of the intrepid self-reliance of American men who opened a universal Exposition on the day set despite of a world's war abroad is precisely the lesson the big week inspires—optimism, perseverance, confidence and energy that blend into the country's restored credo of prosperity!

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Bakersfield Federal Building

Word comes from Washington, D. C., that working drawings are very nearly completed for Bakersfield's new post-office building, for which congress has appropriated $250,000. Construction will be Class "A." It is expected that work will be started within 90 days.

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Personal

T. Beverly Keim Jr. & Co., architectural engineers, have moved from the Investment building to 1110 Haas building, Los Angeles.

A. B. Rosenthal, architect, has opened an office at 507-8 Lankershim building, Los Angeles. He has several building projects on the boards, and will be glad to receive catalogues, samples and information regarding building materials.

Frederick Noonan, architect, and Wm. Richards, engineer, have moved from the Brockman building to suite 1031-2 Investment building, Los Angeles.

Peter L. Sala, formerly with Stone & Wright, architects of Stockton, has opened an office in the new Commercial and Savings Bank building, Stockton. Mr. Sala recently was granted a certificate to practice architecture by the state board. He would like to receive trade literature, catalogues, etc., from advertisers of this magazine.

Fred E. St. John, an architect who formerly lived in Fresno, has returned to that city and opened offices in the L. L. Cory building. He believes in a big growth and future for that city.

San Francisco Skyscraper

Willis Polk & Co., who designed the Hobart building, the last tall structure to be erected in San Francisco, will have the distinction of again putting up an expensive skyscraper. Plans are being prepared by Mr. Polk for a 12-story Class "A" office building to be erected at Montgomery and Pine streets for the McCreery Estate and which will be known as the Western Union Building. Practically the entire structure will be leased by the Western Union Company.

Marriage of Charles Peter Weeks

A marriage of interest to Pacific Coast architects took place early in October when Mrs. Ora Crawford Morris became the bride of Charles Peter Weeks. The ceremony was performed by Rev. C. L. Miel of St. Peter's Church at the home of the bride's father, John R. Crawford, on Chestnut street, Louisville, Ky.

Mrs. Weeks until recently made her home in Louisville, Ky. Mr. Weeks, whose home was formerly in Cleveland, Ohio, has been a practicing architect in San Francisco for fifteen years and has been prominently identified with the work of the San Francisco Architectural Club and the San Francisco Society of Architects. He is a member of the University and Burlingame clubs.

Louis J. Gill A Benedict

Pacific Coast architects who have enjoyed Mr. Louis J. Gill's cover designs which have appeared in the Architect and Engineer from time to time, will be interested to learn of his marriage recently to Miss Mildred Stillman of Syracuse, N. Y., formerly head of the art department in Wyoming Seminary, Wilkesbarre, Pa. Mr. Gill is junior member of the architectural firm of Gill & Gill of San Diego.

City Hall Competition

Competitive plans for a new city hall at Tucson, Arizona, under the recent bond issue have been received by the city council. The following architects submitted plans: H. C. Deckbar and Robert M. Taylor of Los Angeles, Marsh & Wallingford of Phoenix, W. H. Wheeler and E. H. Holmes of San Diego, Trost & Trost of El Paso, and Bray & Tobey, H. O. Jaastad, Sidney F. Mashbir of Tucson.

Los Angeles Chapter Elects Officers

The annual meeting of Los Angeles Chapter, A. I. A., was held Tuesday, October 19th. S. Tilden Norton was elected president, the other officers elected being: J. E. Allison, vice-president; Fernand Parmentier, secretary; and August Wackerbarth, treasurer. Secretary Parmentier was granted a leave of absence and A. R. Walker was appointed acting secretary.

Robert D. Farquhar was elected to fill the three-year term and J. J. Backus the two-year term, on the board of directors. Jos. J. Blick of Pasadena, is the third director. As delegates to the Forty-ninth annual convention to be held in Washington, D. C., the Chapter elected Messrs. John C. Austin, Alfred F. Rosenheim, S. Tilden Norton, Lyman Farwell, and Albert C. Martin. The president was authorized to appoint alternates in case any of the regularly elected delegates find it impossible to attend the convention.

Mr. Edward Stotz of Pittsburg, a Fellow of the A. I. A., and member of the Board of Directors, was present as the guest of the Chapter and addressed the members on the work of the Chapters of Pennsylvania and their method of handling some of the problems which are common to all organizations.

The annual reports of the officers were read and approved, the report of the secretary being very complete and giving a resume of the entire year's work.

San Francisco Chapter Elects Officers

The annual meeting of the San Francisco Chapter A. I. A., was held in October and the old board of officers was re-elected with the exception of the two new members comprising the board of trustees. These are W. H. Toepke and Walter Parker.

Residence for Ex-Lieut. Governor Porter

Messrs. Bakewell & Brown of San Francisco have completed plans and have taken bids for an attractive country residence to be built in Berkeley for Ex-Lieut. Governor Warren R. Porter. The estimated cost is $15,000.

Hospital at Woodside

Houghton Sawyer, the San Francisco architect, has revised the plans for a private hospital or sanitarium at Woodside, near Palo Alto, for Mrs. Elise A. Drexler. From $60,000 to $100,000 will be expended.

Paso Robles School

Wm. H. Weeks has been commissioned to prepare plans for a $35,000 grammar school building at Paso Robles. Structure will be in the Mission style of architecture, one story, and will have hollow tile or concrete walls and terra cotta roof.

Architect Wins

It is a peculiar coincidence that within a few weeks after the architects of California, and Los Angeles in particular, as a result of several years of labor, secured the repeal of the law of 1872 which required a competition for the selection of an architect to prepare plans for public school buildings, a decision should be rendered by the Supreme Court of the State declaring the law to be obsolete. If this decision had been rendered a number of years ago it would have relieved a most embarrassing situation and saved considerable trouble and expense.

The decision of the Supreme Court was recently rendered in the case of Architect Fred T. Harris of El Centro, against L. E. Cooley, superintendent of schools of Imperial county, to compel Cooley to approve a warrant issued to Harris by the board of trustees for $1997.35, the balance due on his commission on a contract made in 1912 for the erection of the Union High School building at El Centro. Cooley refused to approve the warrant on the ground that the provisions of the law of 1872 had not been complied with when Harris was appointed architect. The Superior Court decided against Harris and its judgment was affirmed by the Appellate Court. On appeal, the State Supreme Court has decided that the Superior Court based its opinion on a statute now obsolete and the judgment of the lower court is reversed.

Two Large Apartment Houses

J. C. Hladik, the San Francisco architect, is completing plans for two large apartment houses, one of which will be erected on the northeast corner of Van Ness avenue and McAllister street, for Geode Urioste of 189 Buena Vista avenue, San Francisco. Construction will be steel and concrete. There will be 200 rooms and the estimated cost is $140,000.

Porterville Architect Granted Certificate

W. F. Griffin, architect of Porterville, has been granted a certificate to practice by the State Board of Architecture, Northern District. Mr. Griffin has designed many of the most prominent buildings in Porterville and vicinity, including school houses, business blocks and residences.

Partnership Dissolved

San Francisco, November 6, 1915.

The Architect and Engineer,
San Francisco.

Gentlemen: Beg leave to notify you and ask that you publish a small statement that the firm of Havens & Toepke is dissolving partnership, and that each member of the firm will continue in business under his own name. Until affairs are settled, the office will remain in present location, each transacting his own business.

Very truly yours,
WILL H. TOEPKE.

Washington State Chapter, A. I. A.

A postponed meeting of Washington State Chapter, A. I. A., was held October 21, at the clubhouse of the Seattle Architectural Club. It was decided to hold meetings there in the future. Twelve members were in attendance.

A discussion as to the advisability of discontinuing the publication of the proceedings of the annual conventions of the institute resulted in a motion to the effect that the proceedings constituted a valuable historical record of interest to each member of the institute, especially to those who are unable to attend the conventions, and that the chapter deprecated the suggested change in printing a digest of the proceedings in the Journal.

Renewed attempts to secure the passage of a state licensing law were decided upon, active efforts to be started after the annual meeting.

Architect Willcox entertained the members present with a brief account of the doings of the executive committee at San Francisco, and an interested characterization of the architecture of the fair, which latter provoked a lively discussion as to the effects and trend of present-day architecture.

Did This Really Happen?

More than fifty architects submitted plans in connection with the competition of a Carnegie library building at Sacramento. A good story is told at the expense of a coterie of San Francisco architects who accepted the hospitality of a fellow member of the profession and journeyed to the capital city in a private yacht. Each member of the party took along his plans, doubtless intending to file them with the Sacramento officials immediately upon arrival. The plans were to be in the committee's hands Monday, Nov. 1, at noon. The yachting party left San Francisco Saturday evening, cruised all Sunday, and was due to put into Sacramento Monday morning. But something happened to the craft and a landing was not effected till late Monday afternoon. The party hustled to the city hall only to find the doors locked. It has since developed that the architect who gave the party shipped his drawings by express before he left San Francisco. He carried a "phony" package just to fool the boys, who now believe the boat was marooned on purpose.

Note—The Editor declines to vouch for the truth of this story, which is a good one, nevertheless.

E. W. Cannon Busy

E. W. Cannon, architect of Oakland, formerly with C. W. Dickey, has completed plans for a two-story $20,000 apartment house for Mrs. Elizabeth Gilseman. It will be built at Webster and Magnolia streets. Mr. Cannon has let contracts for a $7,000 residence in Northbrae, Berkeley, and has plans under way for an apartment house in Piedmont.

Steel Viaduct for Foot of Market Street

A steel viaduct to relieve the congested traffic conditions at the foot of Market street, San Francisco, will be built from the second floor of the Ferry building across the Embarcadero to a point on the westerly side just north of Sacramento street, plans having been adopted by the Board of State Harbor Commissioners.

The plans adopted are the result of a protracted investigation into the feasibility of erecting a viaduct to safeguard pedestrians. As indorsed, they call for a bridge about 250 feet long, 20 feet high and 12 feet wide. Two large spans each 100 feet long are contemplated, with a shorter one 17 feet long, to cross the Belt Line Railroad tracks.

The entire structure will be built of steel incased in wire, lath and plaster, and will run from the sidewalk on the west side of the Embarcadero to a point just north of the center of the Ferry Building.

New Sutter Street Building

The real estate firm of Harrigan, Weidenmuller Co. of San Francisco report having closed a lease for Charles Schlesinger for a two-story building to be constructed in San Francisco on the northwest corner of Sutter and Mason streets, 50x137:6, to be used by H. Taylor Curtis for studio, art and auction rooms. Plans have been prepared by Alfred Henry Jacobs, 110 Sutter street.

Bank of Italy Addition

Plans have been prepared by F. D. Wolfe of San Jose for extensive alterations to the first floor of the Bank of Italy building, San Jose. The stairway leading from the street to the second floor of the building will be moved to the extreme east end of the building and the quarters now occupied by the Builders' Exchange will be dispensed with, the bank making use of the entire ground floor. About $5,000 will be expended.

Brick Hotel, Los Angeles

Charles Kysor, 618 Wright & Callender building, Los Angeles, has drawn plans for a four-story and part basement brick hotel building to be erected on Sixth street near Ruth avenue, for A. L. Phillips, president of the Santa Fe Warehouse Company. The building will contain two store rooms, hotel lobby, about 60 sleeping rooms and 15 bathrooms.

Concrete Factory

One of the largest buildings to be figured this month by San Francisco contractors is a three-story reinforced concrete factory, to be erected at Fourth and Brannan streets for the John Bollman Company. The estimated cost is $170,000. Charles Peter Weeks is the architect.

Encouraging Outlook in the Northwest

Mr. H. M. Reynolds, manager on the Pacific Coast for the C. A. Dunham Company, Marshalltown, Iowa, manufacturers of the well known Dunham Radiator Trap and Dunham Vapor System, recently returned from a business trip through the Northwest. He found Seattle and Portland enjoying greater prosperity than for a year or more. Seattle, he said, is getting back into her stride, and there is more substantial building under way and in prospect there now than has been the case for some time. Mr. Reynolds says his company is doing more coast business now than ever before in its history. He looks for a banner year in 1916.

San Francisco Municipal Buildings

The Bureau of Architecture of the Board of Works have plans under way for the following:

One-story frame structure to be erected for isolation purposes at San Francisco Isolation Hospital. This will be ready for figures in a couple of weeks, and will cost $7,000.

The Emergency hospital for the Civic Center, a Class "C" building of two stories to cost $20,000. Plans just started.

A new school, class of construction not decided, to cost $20,000 and to be erected on Bernal Heights, between Folsom and Banks streets.

Death of Los Angeles Contractor

J. A. Winget, president of the Winget Construction Company of Los Angeles, died October 17th at the Good Samaritan hospital in that city, following a considerable period of illness, although he kept with his work until about ten days before the end came. Mr. Winget was 52 years of age and had been contracting extensively for thirty years. The company of which he was the head is now engaged in the erection of the $248,000 state normal school at Fresno.

Fresno Hospital

Julius Krafft & Sons of San Francisco have prepared preliminary plans for a six-story steel frame Class "C" hospital to be erected at Fresno and S streets, Fresno, for the Burnett Sanitarium Association. The building is to be designed on lines similar to the Mount Zion hospital, recently completed by this same firm of architects in San Francisco.

Well Known Contractor Dies

Bernard James Duffy, a contractor of San Francisco, died at Chico October 12th of apoplexy. Duffy had the contract for building the Federal postoffice. He was 42 years old, and well known as a contractor on public and state buildings, particularly the dormitory of the State Farm at Davis.

Wonder Who's the Contractor

(From the San Francisco Chronicle.)

CARRYING the warmth of the message into the hotels, the downtown business blocks, the city's streets and the courts and avenues of Wonder Town, many women worked the other day to further the plan to preserve for all time a worthy portion of the Exposition.

Their medium for raising funds was the selling of badges labeled: "Exposition Preservation League—San Francisco, 1915." They were charming women, all of them, and they met with a round measure of success.

But two of them, furthering the cause together, encountered unexpected opposition from a well-dressed woman whom they approached with a badge.

"No," said the woman, almost savagely. "I do not care for one of those things."

The purveyors looked astonished, more at the woman's manner than her words.

"But why?" they asked, in a breath.

"Because, if you must know," replied the woman, tapping her foot on the pavement, "my husband has been counting on getting the contract to tear those buildings down!"

Concrete Used 200 B. C.

A concrete aqueduct constructed 200 B. C. at Tarragona, Spain, is described by John R. Rippey in Engineering News. This structure is 22 miles long and portions are carried on viaducts. At one point the viaduct is 123 feet high and consists of two tiers of arches of 22-ft., 6-in. span. Stone, brick and concrete were used in the structure and broken brick were used as aggregate for portions of the concrete. Little remains of the waterway, but some parts of the supporting structure are remarkably well preserved. The Spanish government is taking steps to protect the structure.

Berkeley Contractor Back from East

Henry M. McCullough of Kidder & McCullough, Berkeley contractors, recently returned from an extensive business trip which took him to New York, Washington, Chicago, Philadelphia, New Orleans and Los Angeles. He says he found conditions in California better than in any of the places visited by him. Everybody, he declares, talks about California, and he predicts a big influx of permanent visitors next year.

McCullough says that the Exposition is spoken of everywhere as the greatest thing that ever happened.

Speaks Well for Present Management

The Santa Cruz Portland Cement Co., San Francisco, has declared a dividend of $1.15 per share in addition to the regular quarterly dividend of 75 cents per share.

A. I. A. Chapter Committees

The following is a list of the members of the standing and special committees of the Southern California Chapter, A. I. A., appointed by President S. Tilden Norton to serve during the ensuing year:

Standing Committees

A. I. A. Sub-committee on Public Information—H. F. Withey, John P. Krempel, H. M. Patterson.

Membership—F. P. Davis, W. E. Erkes, H. H. Martin.

Entertainment—A. M. Edelman, John C. Austin, Octavius Morgan.

Special Committees

A. I. A. Sub-committee on Competitions—J. E. Allison, A. F. Rosenheim, Robt. H. Orr.

Ethics and Practice—Percy A. Eisen, Robt. Farquhar, S. B. Marston.

City Planning—John C. Austin, D. C. Allison, Elmer Grey.

Special Committee on Building Companies—P. A. Eisen, H. M. Patterson, Robt. H. Orr.

Permanent Committee on Legislation—J. J. Backus, O. W. Morgan, Jr., R. C. Farrell.

A. I. A. Sub-committee on Education—J. T. Vawter, Elmer Grey, D. C. Allison.

Contracts and Specifications—Geo. E. Bergstrom, A. C. Martin, B. M. Morris.

What Next?

The San Francisco labor unions, not satisfied with delaying the stone work on the Civic Center municipal buildings, have made objections to a change in the specifications for the glass work on the city hall. Their sole reason appears to be that the change would mean less work for the glassworkers. That is certainly "going some," and, as one of the daily papers states: "Public opinion will never permit any labor union to dictate the architecture of our public buildings."

Ideal Treatment for Foot of Market Street

Ernest Weihe, a draughtsman in the offices of Messrs. Bakewell & Brown, has been awarded first prize by the San Francisco Society of Architects for designing an ideal treatment for the relief of traffic congestion at the foot of Market street, San Francisco. Mr. Weihe's scheme, with descriptive text, will be published in the December number of this magazine.

Berkeley Apartments

James W. Plachek, the Berkeley architect, has prepared plans and taken figures for the construction of a two-story and basement frame and brick veneer apartment house on the southeast corner of University avenue and Grove street, Berkeley. William Heywood is the owner. The cost is estimated at $25,000.

Four Modern Residences

Willis Polk & Company of San Francisco have applied for a permit to construct four high class residences on Jones street, near Vallejo, for Norman B. Livermore. They will cost $7,500 each and are to be built for investment purposes.

Splendid Tribute to Mr. Mullgardt

(From the San Francisco Chronicle.)

IN A series of ninety-six illustrations, consisting of mounted duo-tone prints, Louis Mullgardt, architect of the Court of Abundance, gives a pictorial survey of the Exposition's triumph as a display of architecture and landscape gardening. So beautiful are these pictures one turns them over and over again before stopping to look at the accompanying prose descriptions. After sampling a few of these half-page prose sketches one realizes what a lot of information the author has been able to compress into so short a space.

Next, one turns back to the general introduction, another instance of compression, and finally one comes to that delightful "Reflection," a sort of prose frontispiece, and one thinks that perhaps a poet was lost when the world gained a great architect.

That Mullgardt is a great architect, in the sense the term is used when applied to those of international fame, is no longer a matter for doubt. It needs no voice from San Francisco to sound his praises. They have been proclaimed by some of the most distinguished art critics of the East and Europe, and that fact sets the seal securely upon his reputation.

Says the author: "International Expositions are independent kingdoms in their corporate relation with other countries of the world. They are phantom kingdoms wherein the people do everything but sleep. They germinate and grow with phenomenal energy. Their existence is established without conquest, and their magic growth is similar to the mushroom and the moonflower; they vanish like setting suns in their own radiance. Thousands of neophytes of every race, creed and color come with willing hearts and hands to do homage and bear manna to nourish the sinews of a phantom kingdom."

War Affects European Architects

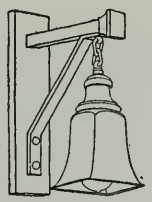
The following advertisement appeared recently in the London Architect and Builder, which shows the effect of the war on the members of the architectural profession abroad:

Architects' War Committee

Architects in need of employment in consequence of the War are invited to submit their names to the Hon. Secretary of the Professional Employment Committee of the Architects' War Committee at 28 Bedford Square, London, W. C. Applications can only be considered from bona fide architects dependent upon their profession for a living, whose present difficulties are caused by the War, and who are not eligible for military service. All cases are dealt with in confidence by a small Sub-Committee.

Plans Approved for Willows Postoffice

The sketch plans for the Willows postoffice have finally been approved by the cabinet officers and Treasury Department at Washington, and the architects, Messrs. Bliss & Faville, of San Francisco, have been instructed to proceed with the working drawings without delay.



Heating and Lighting

Plumbing and Electrical Work

Get Maximum Heat at Minimum Cost

A PROBLEM which reaches into nearly every home in the United States and touches the pocketbooks of several million householders is discussed seriously in a report recently issued by the Bureau of Mines, Department of the Interior, in which the experts of the bureau tell the public in detail just how, in heating their houses this coming winter, they may save in their coal bills.

The report, issued at a time when the cooler weather is upon the country and people are laying in their winter supply of coal, intimates that large savings can be made in nearly every home and gives specific figures of the results obtained in one home in which every effort was made to consume the coal properly. As the report was issued solely for the benefit of householders, copies may be obtained by anyone who addresses the United States Bureau of Mines.

The tests referred to were made in a ten-room house in New Haven, Conn., which was comfortably heated at a cost of $48 for the fall and winter, a saving over other houses of the same size in the same locality of from $50 to $100.

According to Van. H. Manning, Director of the Bureau of Mines, similar results can be attained in hundreds of thousands of houses throughout the country with a consequent saving of millions of dollars.

"The report shows not only a low cost of heating," said Mr. Manning, "but also an economical use of fuel and illustrates what savings may be effected when the problem is given proper consideration. Systematic and regular handling of the fire doubtless had considerable to do with the results obtained. The cost of heating is probably $50 to $100 less than what is expended by a large number of householders who live in the same locality and have about the same heating requirements, but use more expensive coal and give their heating equipment less attention.

"The value a householder gets from the fuel he burns depends largely on the character of the heating apparatus, the conditions under which it is installed and the manner in which the fire is handled. The authors of this report, from their experience in firing residence-heating apparatus and from observing the methods employed by many who attend to such apparatus, keenly appreciate the importance of proper firing methods and they have written this report in the belief that some general remarks on the selection, care, and operation of residence-heating apparatus may prove of some value to many who are interested in burning fuel in the most economical manner."

The authors are L. P. Breckenridge, consulting engineer of the Bureau of Mines and professor mechanical engineering Sheffield Scientific School, Yale University, and S. B. Flagg, mechanical engineer of the Bureau of Mines.

Among other things, the report states: "Many furnaces and boilers are operated in a haphazard way—drafts are opened or coal is put on when the house becomes cool, then the fire is allowed to burn rapidly until either the rooms are too warm or the fuel bed is burned down too far to kindle properly a new charge of coal.

"Such firing is always wasteful. The heater should receive regular attention, and if the demands for heat are intelligently anticipated, as they ordinarily can be, the house can be warmed with minimum trouble and fuel. When the rooms become too warm the fire should be checked by stopping the admission of air under the grate and decreasing the draft by opening the 'check damper.' If, as often is done, the ash pit damper or the ash pit door be allowed to remain open and the draft reduced by opening the fire door, the combustion of the fuel continues, although at a slower rate, but the cold air entering the fire door chills the heater so that little heat is realized from the coal.

"To burn a pound of coal requires very much more than a pound of air, and the volume of a pound of air at atmospheric pressure is far greater than that of a pound of coal. To burn more coal requires more air, and this air must be forced into the ash pit and up through the fuel bed by the difference between the pressure of the hot air and gases over the fire pot and that of the air entering the ash pit—in other words, by the 'draft.'"

Lawmakers Should Not Meddle with the Heating Trades Affairs

THE Heating and Ventilating Magazine has a timely editorial utterance in the September number on the tendency shown by the lawmakers of various states to enact meddlesome and unnecessary legislation dealing with the heating trades. What is true of the heating trades is equally true of other lines, so much so that most of the trade bodies are beginning to recognize the importance of having legislative committees to keep a close watch on this meddlesome tendency.

"The importance to the heating trade of watching the course of pending legislation in the various state legislatures," observes the "Heating and Ventilating Magazine," "does not, ordinarily, appeal to the average heating man, but in the light of the information brought out at the recent convention of the master steam fitters' association, it is evident that a very real danger exists in the passing of drastic and ill-considered laws relating especially to the operation of heating plants. It was brought out, for instance, that a large mass of this sort of legislation was introduced during the past winter, and one of the principle reasons given for its failure to pass was the fact that most of the legislatures were congested with bills. In a few cases the activities of the different associations were effective in rooting out 'jokers' and 'strike legislation,' but in most of the cases cited the trade appeared to be entirely unaware of the dangers that lay before it.

"One of the commonest types of bills coming under this heading were those providing for state inspection of steam boilers, where provision is made for state boards of inspection and requiring boilers to be inspected periodically and a fee to be paid. It is well understood that such a law is intended to apply to power boilers, but where the pressures carried are not mentioned, the passage of such bills, as was tersely stated, 'would mean a large decrease in steam and hot water heating jobs in favor of furnace work, especially in the smaller jobs.'

"One of the most pernicious types of bill is that which provides that all operators of steam boilers over a certain size, and frequently the exemption is very small, must not only be examined by a state board, but must be licensed by a state board to operate a boiler. A number of instances were found where the wording of the bill would require every flat or apartment house which uses steam heat to employ a licensed engineer or fireman to run its boilers.

"Still another class of legislation would empower a state board, and in Pennsylvania, for instance, a local board in each city, to pass arbitrarily upon the safety of each installation before the plant could be accepted and placed in use.

"It will also be a matter of information to many to know that where there is no state law on the subject a municipality can regulate these things in the same way as it provides smoke ordinances and similar restrictions.

"Fortunately, there is little likelihood of further objectionable legislation until 1917, as most of the legislatures have adjourned until that time, but it is predicted that unless preventive measures are taken in the meantime the trade 'can depend upon it that sooner or later every legislature in this country is going to have something to say about boilers and inspection and about insurance.'"

Tuec Has New San Francisco Agency

Announcement is made elsewhere in this issue of an important change in the San Francisco agency of the Tuec Vacuum sweeper. The deal was consummated by Mr. F. W. Eichorn, western sales manager for the United Electric Co., Canton, Ohio, manufacturers of the well known Tuec machine. Mr. Eichorn has been looking about for some time for a strong house to handle the Tuec line and that he has succeeded in making a very strong connection is recognized by those at all familiar with local conditions. The new agents are the San Francisco Compressed Air Cleaning Company, pioneers in the vacuum cleaning business in Northern and Central California. This firm has offices and splendid display rooms at Sutter and Stockton Sts., a location that is close to the building interests of the city and within easy reach of the offices of leading architects, engineers and contractors. The Tuec machine is undisputably one of the most popular vacuum sweepers on the Pacific Coast.

Contracts Let for Reconstructing San Jose Light Tower

The San Jose City Council has let contracts for the erection of a steel and concrete tower at Market and Santa Clara streets, that city, to replace the present structure, which has been declared unsafe. The total cost is to be $6,087. The steel work will be done by the Golden Gate Iron Works and the concrete posts will be erected by Lynden & Bickel of San Francisco.

Odd Hillside Home

Among the building permits recently issued in Berkeley was one to W. W. Mackie for the erection of a novel home on Shasta near Tamalpais avenue in the northeastern portion of the city. Mackie will utilize the structure of an old rock crusher for the foundation and framework of the lower portion of his house. In all the home will be four stories high, climbing up the steep grade in bizarre and romantic manner.

Electrical Prosperity Week in the Pacific Coast States

By H. J. Matthews

IN ORDER to have a better understanding of the whole idea of Electrical Prosperity Week it is highly important that one should make some investigation on his own part as to what the Society for Electrical Development has been accomplishing during the past year or more in the big broad program of popularizing the use of electricity in the world's work.

Trade journals representing a circulation reaching four and a half million readers have been furnished from time to time with articles bearing on use of electricity in lines of industry appropriate to their circulation. Such articles are prepared by the Society's staff of writers and are published without cost to the Society. In the popular magazines the same program has been carried through, reaching readers whose numbers can scarce be calculated.

In upwards of thirty cities the Society has been responsible for starting an electrical page or section in one of the local dailies in which "up-to-the-minute" articles on the uses and conveniences of electricity appear and where the local electrical interests may advertise to the greatest advantage.

Representatives of the Department of Field Co-operation have addressed not only gatherings of electrical men throughout the country but also meetings of merchants, bankers, railroad men, tradesmen, clubs and schools on the work of the Society and its functions as a great factor in promoting and popularizing the use of electricity. The daily press, recognizing the interest of the general public in the subject treated, have been quick to report such address with the result that the message has been carried to the general public.

Through the medium of the "movies" several films prepared under the Society's direction and showing the public the great advantages of complete electric service are being shown simultaneously in upwards of 135 cities, reaching an audience estimated at 4,000,000 people a month.

Members of the Society and non-members alike have profited equally as a result of this great educational work.

This great movement is a gigantic campaign designed to promote optimism, business confidence and prosperity in which through focusing the minds of the general public on the subject of electricity, great industrial reward will be reaped by the whole electrical industry—the central station, manufacturer, jobber, contractor and supply dealer.

Electrical Prosperity Week is not a dream of the visionary. It is a well-founded, logical and thorough plan of co-operation among electrical interests for stimulating business in general and the electrical industry in particular.

The week of November 29th to December 4th has been selected as being most appropriate since it is in keeping with the "shop-early" campaign for gift-buying and will serve greatly to stimulate the sale of electrical appliances. Moreover it is concurrent with the closing week of the Panama-Pacific International Exposition and the week has been officially designated as Electrical Prosperity Week.

Among the societies and associations which have endorsed the movement are the National Electric Light Association, the Northwest Electric Light & Power Association, the National Electric Contractors' Association, Electrical Supply Jobbers' Association, Electric Vehicle Association of America, Jovian Leagues throughout America, International Association of Display Managers and the Rotary Clubs of America.

The Pacific Coast and adjoining states offer a fertile field for profit and development to the electrical industries through active co-operation along the lines presented in the Society's literature. With the already great consumption of current per capita and the enormous undeveloped power resources available, the Far West may truly become the greatest electrical zone of America. Despite the fact that the combined population of the States of California, Oregon and Washington is less than the population of New York City, the use of electricity per capita is greater in these states than in any other section of the country. Cheaper power and the enterprise of the people are responsible for this, but there are still greater possibilities ahead. California now stands as second state in the Union in kilowatt rating and in kilowatt hour output. While now third in gross income to power companies there is good reason to believe it will soon rank first, and that Oregon and Washington will also show proportionate development.—Journal of Electricity, Power and Gas.

Big Smelter Plant

Messrs. Bradley-Buff and Labrathe, engineers in the Hobart building, San Francisco, have been commissioned by the management of the Bunker Hill & Sullivan Mining Co. to prepare plans for a $1,000,000 smelter plant to be erected on their property in Kellog, Idaho. Mr. Easton, manager of the mining company, states that it is possible that the plant may be located in either Seattle or Portland, as the freight rates on ore from Kellog are very high.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

Marking Safety Zones

By JAMES E. HOBART in Municipal Engineering

THE system of street marking which has been in use at the principal street crossings in Indianapolis for several weeks seems to help not only the pedestrian, but the motorman and also the automobile driver. But, like some other good things, they seem to be carrying it a bit too far and adding a lot of posts and chains to the markings.

The safety zone system consists of broad white lines painted upon the pavement to indicate where vehicles may and may not go, where pedestrians may not go, and where they may stand and wait in safety for the street car. And the markings also show to the motorman just where he must stop his car and not encroach upon the foot passenger's territory at street crossings.

The markings are indicated by the double lines in the cuts. White paint is used for them and the lines are made about 4 inches wide. The lines forming a square around the street intersection are first laid down, following the curb lines across the streets, but are rounded at the ends, so that instead of intersecting the curbs, the lines join each other by means of a short curve, about 2 feet from the curb, the corner of which is also rounded. Inside these lines no foot passenger has any business whatever, and the traffic policeman has that square for his exclusive territory, save for the wheel traffic from every direction.

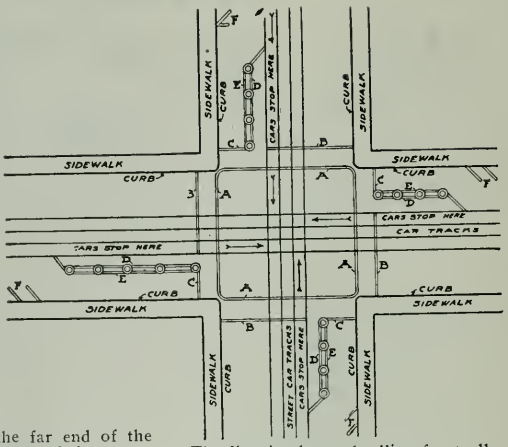
Next, lines are laid down which are continuations of the building lines as found upon the several streets. These lines begin at the curb on that side of the street where the cars do not stop, and run on the building line direction, past the middle of the streets, and stop at the last rail of the last car track in that street. Some streets are marked with these lines extending clear across from curb to curb, but to the last rail of the car track seems the better way.

A space several feet wide is marked off along the car track, on the "near" side of the street, and this space is the safety zone, to provide and protect which the system of lines has been worked out. The safety zone extends along the track, between it and the painted parallel line seen in the photograph, as far as the traffic demands. Some of the safety zones are longer than others. The length is made according to the amount of traffic found at any corner. The zone is made one car length, also for two cars, and in some places three cars long.

The painted line on the building line is carried from the safety zone space until it reaches the curb on the "near" side of the street. The foot passenger now has a straight, clear right of way from one side of the street to the other, and with a way into the safety zone from which he may step into a car.

The two lines shown in the photograph of the safety zone are about 18 or 20 inches apart. The inner line was first laid down 6 feet from the track, as the limit of the safety zone, but they did not count on the overhang of the car, so they had to draw new lines 6 feet from the side of the car. The inner lines will not be renewed, and, as shown in the photograph, are becoming faint and will

SAFETY ZONE for street car passengers, showing the lines D and E of the diagram and the posts, signs and chains to emphasize line E. A similar post with hose and a semaphore, lettered "Stop-Stop," "Go-Go," stands by the traffic policeman near the center of the intersection, and signals the traffic to wait or to proceed, aided also by the policeman's whistle and arm in case of slow, impatient or inattentive drivers.



PLAN OF SAFETY ZONES at an Indianapolis street crossing. A, B—White bands to keep foot traffic off the intersection and street in block between crossings.

C—White bands defining stopping place for vehicles until semophore or policeman shows crossing open.

D—Line defining safety zone for street car passengers, which was too close to car and was moved to E. Along E are set posts with chains, as shown in photograph.

F—Lines defining end of parking space for vehicles in the block and fixing passageway for moving automobiles, which must turn from their line of travel along the car tracks at this point to travel along the curb through the safety-zone region.

soon disappear. At the far end of the safety zone in the photograph is seen a diagonal line which extends to the car track. Automobiles coming along the street necessarily are obliged to keep pretty close to the car track on account of the parking of automobiles along the curb. To give room for automobiles to pass the space occupied by the zone of safety, two short diagonal lines are drawn from the curb opposite to and parallel with the diagonal line, limiting the end of the safety zone. These lines mean to the automobile driver that he must not park his car between those lines and the corner. This means that automobiles will always have plenty of room to swing toward the curb when they come to the zone of safety, with no parked machines there to trouble them. It also means to the pedestrian that he can at all times cross from the curb to the zone of safety without having to squeeze through between parked automobiles. This, however, is something which the police department did not count upon, for foot passengers are supposed to walk down between the lines extending the curb and building lines across the street until they reach the zone of safety. But it does not work that way, and when a street car comes along, the people flock to it across the automobile space and dodge in and out between the cars which are being held up by the traffic officer while waiting their turn to cross the intersecting street.

The painted line on the building line forms a deadline for automobiles. They are expected not to run past that line until permitted by the officer. And I watched them many times, to notice each time a car ran past line C a little, that a wave from the officer's hand was always forthcoming and the offending car backed off the line.

The line is also a deadline for trolley cars about to stop for passengers. The motorman has found that is was decidedly unpleasant to run past this line, for the corner policeman always notices it, and if the car doesn't back up, the number of the car goes into the officer's notebook and the motorman hears about it next day from the police department.

Thus far, the Indianapolis safety zone business seems all to the good and fair to footmen, automobiles, wagons and street cars, but here is where the system may be carried too far. On the boundary line of the safety zone are several small circles, from 18 to 24 inches in diameter and 12 to 20 feet apart. These circles are occupied by cast-iron bases, as seen in the photograph; made very heavy so they will not overturn easily. A pipe post extends upward about four or five feet and is terminated by a "cross," through which a chain is passed and made fast on the end post and one or more of the intermediates. This chain is stretched the entire length of the zone of safety, and is supposed to prevent people from getting into automobile territory and to keep automobiles off the zone of safety.

The base of this post weighs apparently about 100 pounds. A man can move it easily. In the photograph are shown seven posts and the connecting chain, and I leave it to the imagination of the reader as to what will happen when a man chances to surge against one of these standards, or an automobile goes a little off its course, overruns the mark a bit or skids a little when the asphalt is slippery, and touches one of these post standards. During the first few days of their use posts were tipped over by foot passengers and by automobiles, and posts were even broken by collision of auto-

mobiles with them. But experience is a good teacher, and speed is now reduced until such accidents are few and slight. Foot passengers also learned promptly that they could not lean against the posts with impunity.

There are other features of the automobile control system in Indianapolis which do credit to the police department, and among them is the scheme for marking the fire hydrant locations. In the business section some fire hydrants are below the surface of the street, and a cast-iron cover plate must be raised to permit access to the fire connections. Wherever one of these hydrants is located there will be seen a couple of oblique lines extending from the curb into the street. Whenever a set of these lines is found, it tells the auto driver not to park his car between those lines, as there is a fire hydrant there.

The driver is further warned by an "Order of Police Department" signs, placed on the curb opposite the fire hydrant. This sign reads, "Fire Hydrant, Park No Cars Here. Order of Police Department."

One very good arrangement is in force at Indianapolis street crossings in relation to the fire department. Whenever the fire automobiles come charging down the traffic officer blows three blasts upon his whistle, and everything stops or clears the street forthwith. The fire department co-operates with the police in this matter by the installation of electric bells at all street corners where traffic officers are necessary.

When a fire alarm is turned in, these street corner bells are set a-ringing in advance of the fire apparatus, so that vehicles have ample time to clear the track.

The police department is placing at street intersections the semaphore stand and target on the stand of the traffic officer. With this new instrument, the officer need not blow his whistle, one blast to start north and south traffic, two blasts for east and west movements. He only needs to turn the semaphore and the sign "Stop—Stop" does the work for one direction, while the words "Go—Go" on the other target take care of the crosswise travel.

An $885,000 California Irrigation System

An extensive irrigation development is planned by the Terra Bella Irrigation District of Terra Bella, California. An important feature of the project will be a distributing system of riveted sheet steel pipe. The other works include a diversion dam, diversion canal, a reservoir, outlet canal and booster pumping stations. The total estimated cost of the works, exclusive of lands, water rights and rights of way is $885,000. Final report on the improvement has just been submitted to the district by Stephen E. Kieffer, Consulting Engineer, San Francisco.

The principal items in the proposed work, in outline, as now planned, are as follows:

Diversion Dam.—Loose rock fill, slightly manhandled and spalled on faces and crown. Slopes 1 to 1. Crown width 6 ft. Inner face waterproofed and crown covered with 5-in. concrete skin over wire mesh, and footed in trench excavated in granite bedrock. Maximum height of crest above stream bed, 33 ft. Length, 230 ft.

Diversion Canal.—Total length, 24,800 ft. Upper section, 6 ft. bottom width and 5.2 ft. depth water. Lower section, 4 ft. bottom and 3.6 ft. depth water. Capacity, 225 sec. ft. Excavated largely in solid granite. Concrete lined, in part, 1,120 ft. 5 by 7 tunnel in solid rock.

Reservoir.—Capacity, 28,000 acre ft. Five dams, four of hydraulic fill type and one loose rock fill similar to diversion dam.

Dam No. 1 will contain 1,422,000 cu. yds. earth fill. Top width 20 ft. Inner slopes 2, 2.5 and 3 to 1. Outer slopes 2 and 2.5 to 1. Maximum height, 115 ft.

Dam No. 2 will contain 197,000 cu. yds. earth fill. Top width, 16 ft. Slopes same as for No. 1. Maximum height, 78 feet.

Dam No. 3. Loose rock fill. Dry laid water face and top 3 ft. thick. Water face covered with 8-in. reinforced concrete tied to bedrock. Top width 7 ft. Maximum height, 37 ft.

Dams Nos. 4 and 5. Total 10,000 cu. yds. earth fill. Slopes. Inner, 2 and 2.5 to 1; outer, 2 to 1. Top width, 12 ft. Maximum height, 33 ft.

Outlet Canal.—Total length about 10 miles. Capacity from 54 to 10 sec. ft. At present to be dirt section, but ultimately to be lined with ¾-in. cement mortar over wire.

Distributing Pipe System.—80 miles riveted sheet steel pipe from 26 in. to 4 in. in diameter.

Boosting Pump Stations.—There will be two boosting pump stations equipped with 8-in. and 12-in. horizontal single stage centrifugal pumps, direct connected to electric motors. These will be used to lift water from the outlet canal to lands above that level.

One Plant Will Produce That Many Barrels a Day Now

The Los Angeles Express publishes an interesting column entitled "Twenty-five Years Ago Today." In a recent issue appeared the following item suggestive of the growth of the Portland cement industry:

"The new Portland cement plant on land acquired by the syndicate near El Toro is expected to produce 13,000 barrels of cement a year."

EXHIBIT OF THE ARMSTRONG CORK COMPANY, P. P. I. E.

Grand Prize—Armstrong Cork

THE Armstrong Cork Company's splendid display in the Palace of Manufactures at the Panama-Pacific Exposition, is a joint exhibit of the two allied corporations, the Armstrong Cork Company and the Armstrong Cork and Insulation Company. Here is shown cork in all stages from the virgin cork on the cork tree to the finished product. Attractively arranged in 95 jars are shown as many varieties of corks from a canteen cork to a champagne cork. In show cases are exhibited an amazing variety of cork specialties, among them being: Cork discs for bottle caps, seine and gill corks, pin cushions, table mats, churn strips, shoe daubers, insoles, polishing wheels, fishing floats, optical strips, running handles, plasters' floats, lame lifts, penholder tips, baseball centers, surf balls, fishing rod handles, cork paper for cigarette tips, and a wide assortment of gaskets, pulley rim covers and carburetor, oil, and gasoline floats for motor cars. On shelves below the showcases are seen the bulkier articles made of cork, such as life preservers, ring buoys, yacht fenders, mooring buoys, bath mats and lap boards.

Another portion of the Armstrong exhibit is that of heat insulating specialties, including Nonpareil High Pressure Covering for steam lines and

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Thousand of *particular* contractors have tested and PROVEN the quality of WYBRO Panels.

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THE BIG-AN-LITTLE CONCRETE and MORTAR MIXER

Big Output—Little Weight
Big Profits—Little Cost
Capacity 35 Cu. Yds. a Day

All rounded surfaces—no corners for concrete to lodge in. Revolves on ball thrust bearing, hermetically sealed to prevent grit from working in.

Equipped with levers for turning over and locking device to hold drum in place while mixing.

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other heated surfaces, Nonpareil Corkboard for insulating cold storage warehouses, ice factories, etc.; Nonpareil Cork Pipe Covering for brine, ammonia and drinking water lines and Nonpareil Insulating Brick which are so light that they float on water.

Then come the famous Nonpareil Cork Tiling for museums, libraries, billiard rooms, etc., and Linotile for floors of offices, banks, theatres, stores, kitchens, pantries, etc., also, the Cork Paving Brick is shown, a combination of finely ground cork and asphalt, which is finding general use in dairy barns, piggeries, etc.

Finally, a full line of Armstrong Linoleums is shown.

Moving pictures, specimen bed-room and living room and displays of insulating materials and of basic ingredients go to finish off a display as unique as it is interesting and educative.

Cities Using Olmsted Slate Blackboards

Whitaker & Ray-Wiggin Co., 776 Mission Street, San Francisco, report a steady increase in the number of schools using their Olmsted artificial slate blackboards. In many respects this blackboard is said to be superior to the genuine slate and in addition it is much less expensive. Following is a partial list of some of the school buildings in Northern and Central California equipped with Olmsted slate:

Schools in San Francisco

Lowell High School
Portola Grammar School
Mission Grammar School
Spring Valley Grammar School
Jean Parker Grammar School
Boys and Girls Aid Society
Bryant Grammar School
Suiro Grammar School
Longfellow Grammar School
Commercial High School
San Francisco State Normal School
Y. M. C. A.
St. Boniface.

Outside of San Francisco

Oakland
San Jose
San Diego
Loa Angeles
Ontario
Berkeley
San Bernardino
Upland
Pleasanton
Antioch
Sacramento
Eureka
Riverside
Beaumont
Colema
Redwood City
Orland
Sebastopol
Selma
Mill Valley
San Rafael
Yuba
Patterson
Crows Landing
Modesto
Banning
Burlingame
Montara
Sausalito
Dos Palos
Ukiah
Galt
Hickman
Crockett
Los Gatos
Madera
Morgan Hill
National City
Williams
Pasadena
Bakersfield
McKittrick
Tulare
Visalia
Turlock

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WONDERFUL EXHIBIT OF W. P. FULLER & COMPANY AT THE PANAMA-PACIFIC EXPOSITION
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218-228 THIRTEENTH ST Bet. Mission and Howard Sts. SAN FRANCISCO, CAL. Telephone: Market 474

Recognition of Fuller Enterprise

It was certainly worthy of note and commendation that the paint house of W. P. Fuller & Co. should have foreseen the practical and exploitation value of the Exposition and installed an exhibit costing approximately $50,000. This exhibit was housed in a "temple" worthy of this exhibit, designed by Louis C. Mullgardt, and located in the Mines Building. It contains, besides the paint exhibits, a model white lead factory, where, by the aid of miniature machinery, the complete process of manufacturing the justly celebrated Pioneer White Lead is shown.

That the judges at the Exposition were appreciative of the artistic and educational value of the Fuller display is shown by the award made to W. P. Fuller & Co. of the Grand Prize, besides two gold Medals of Honor and one gold Medal. The Grand Prize is the highest of all awards and this is the only one given to any paint house.

In conversation with a member of this concern, it was stated that his company had felt much gratified by the results from their exhibit both in attracting the attention of a multitude of visitors and also in the increased sales of their various products.

Robt. W. Hunt & Co. Lease Larger Quarters

Robert W. Hunt & Company, Bureau of Inspection Tests and Consultation, 228-230 Laughlin building, Los Angeles, have moved their office and laboratory to 1026-27-28-29 Black building. In addition they will have a large room of about 600 sq. ft. area in the basement where the physical laboratory will be located. Tests on cement, concrete, aggregate, steel and other structural materials will be made in this laboratory. Facilities will also be installed to make hydrostatic tests on pipe.

The general offices, drafting and inspectors' rooms will be located on the tenth floor. The chemical laboratory will adjoin these.

The best equipment to be found in modern practice will be installed for making analyses, tests and examinations of engineering, structural and industrial materials.

Medal for Hoffman Boiler

The Hoffman Heater Company of Lorain, represented in San Francisco by Mr. T.G. Arrowsmith, 429 Stockton street, has been awarded a medal of honor by the Department of Manufactures and Varied Industries for its high class exhibit at the Panama-Pacific Exposition. The Hoffman Company is now manufacturing a superior grade domestic water heater in various sizes, and is paying particular attention to the service end of the business. The company's Pacific Coast orders are said to have nearly doubled in the past two years, which speaks well for the sound business methods of the local distributors.

Gold Medal for Standard Varnish Works

One of the most attractive displays in the Mines Building at the Panama-Pacific Exposition is that of the Standard Varnish Works of New York, Chicago and San Francisco, represented in the last-named city by Mr. F. T. McHenry. It is very gratifying to the company to receive a gold medal of honor for its display of varnishes and gums, an award based upon excellence of materials as well as attractiveness of the display.

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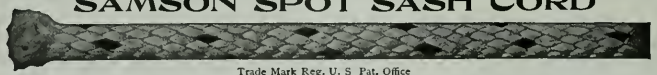

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Ed. R. Bacon Co. Makes a Killing

Edward R. Bacon Co., manufacturers' agents, with offices in San Francisco and Los Angeles, has one of the notable exhibits in the Palace of Machinery at the Panama-Pacific International Exposition. It covers an entire block, some 5,000 square feet, and the exhibit shows a complete assortment of contractors' machinery. This comprises excavating machinery, road graders, dirt scrapers, street sweepers, asphalt rollers, concrete mixers of various types and sizes, contractors' wagons, dump cars, rock crushers, concrete and dirt buckets and hoists, etc. The Jury of Awards must have been overwhelmed by the completeness and value of these exhibits for they not only awarded to them collectively the Medal of Honor, but to every individual exhibit they gave either the grand prize or medals of gold or silver or honorable mention. The awards were distributed as follows:

Medal of honor to Edward R. Bacon Company.

Grand prize to Troy Wagon Works Co.

One gold and one silver medal to Pawling & Harnischfeger Co. (Trench Excavating Machinery.)

Gold medal to Galion Iron Works & Mfg. Co. (Galion Giant Scarifier and Premier and Ideal road building machines.)

Gold medal to Baker Mfg. Co. (Street graders, scrapers, sweepers and sprinklers.)

Gold medal to Erie Machine Shops. (Asphalt rollers.)

Gold medal to M. Haynes. Universal road building machinery (comprising scarifier, leveling blade and five rolling tampers, all in one machine).

Gold medal to Foote Manufacturing Co. (Foote paving mixer with gravity distributing chute.)

Gold medal to Jaeger Machine Co. (Big-an-Litle concrete mixers from 3 cu. ft. hand power machines on skids to 10 ft. Jaeger paver mixer.)

Silver medal to Orenstein-Arthur Koppel Co. (Dump cars and portable track.)

Honorable mention to Universal Crusher Co.

Silver medal to C. J. Young Iron Works. (Young patent clam-shell bucket of 1½ cu. yds. and 1 cu. yd. drag scraper.)

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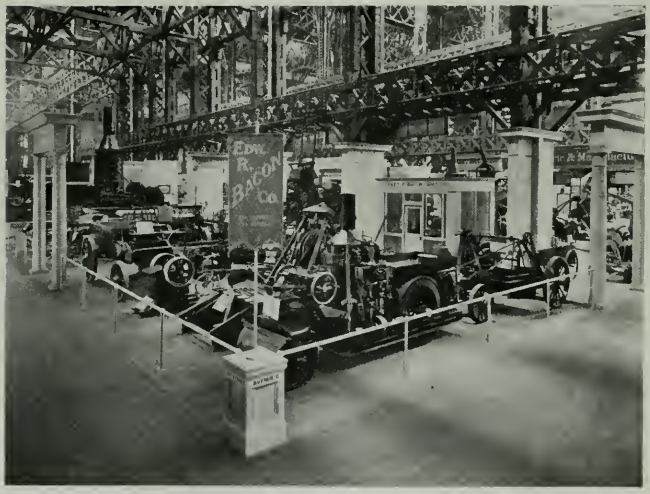

N. E. CORNER EDWARD R. BACON CO.'S EXHIBIT IN PALACE OF MACHINERY, P. P. I. E.

S. W. CORNER EDWARD R. BACON CO.'S EXHIBIT IN PALACE OF MACHINERY, P. P. I. E.

S. E. CORNER EDWARD R. BACON CO.'S EXHIBIT IN PALACE OF MACHINERY, P. P. I. E.

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CHEMICAL AND PHYSICAL TESTING LABORATORIES

Honorable mention to J. C. Biegert Machine Works. (Concrete bucket hoist on concrete distributing system.)

Certainly Edward R. Bacon Company should congratulate themselves on being the Pacific Coast representatives of such a star list of manufacturers, and it would seem that contractors can make no mistake in using this firm's specialties for their entire equipment.

With ample warehouse facilities, Edward R. Bacon Co. are prepared to make quick deliveries of any of the machines they represent, and contractors will avoid long and annoying delays by giving them their orders.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.

(Required by the Act of Congress, August 24, 1912.)

The Architect and Engineer of California; published Monthly at San Francisco, Calif.

Note: This statement is to be made in duplicate, both copies to be delivered by the publisher to the postmaster, who will send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the files of the postoffice.

NAME OF

Editor.....FREDERICK W. JONES

Managing Editor.....FREDERICK W. JONES

617 Monadnock Bldg., San Francisco.

Publisher and Business Manager.....

E. M. C. WHITNEY,

POSTOFFICE ADDRESS

617 Monadnock Bldg., San Francisco.

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Known Bondholders, mortgagees and other security holders, holding 1 per cent or more of total amount of bonds, mortgages or other securities

None.

A. I. WHITNEY,

Signature of Editor, Publisher, Business Manager or Owner.

Sworn to and subscribed before me this 2nd day of October, 1915.

SID S. PALMER,

SEAL

Notary public in and for the City and County of San Francisco, State of California.

(My commission expires Dec. 31st, 1915.)

G. E. Witt Co.'s Oil Burning Plant

The accompanying pictures show the interior of G. E. Witt Co.'s San Francisco factory where the company manufactures its well known oil burning equipments, pump governors, reducing valves, boiler feed-water regulators, etc. The plant is said to be the largest of the kind on the Pacific Coast. The top picture shows the machine shop while the lower plate gives one a good idea of the size and equipment of the assembling room.

G. E. Witt Co., Inc., claim to install more oil plants and burners than all other manufacturers in their line and they boast of being the largest concern of the kind in the world.

The following is a partial list of those using Little Giant and Incandescent Oil Burners:

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O. R. & N. Co. Locomotives and Steamers
Stockton Brewery
Palace Hotel, San Francisco
Southern Pacific Hospital, San Francisco
Wells Fargo Building, San Francisco
Lurline Pumping Station, San Francisco
P. F. Dundon, San Francisco
Risdon Iron Works' Boats
Hunt Bros.' Cannery, Hayward
Bartin Winery, Fresno
Madera Lumber Co.
Stauffer Chemical Co., San Francisco
Black Warrior Copper Co., Arizona
Agnews State Hospital, Agnews
St. James Hotel, San Jose
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Cloverdale Electric Light Co.
California Fruit Canners
Stockton Glass Works
Brown's Paper Mills
National Brewing Co., San Francisco
Jackson Brewing Co., San Francisco
Fredericksburg Brewing Co., San Jose
Milwaukee Brewing Co., San Francisco
Enterprise Brewing Co., San Francisco
National Ice Co., Oakland
National Flour Mills, San Francisco
Humboldt Bay Woolen Mills
Old Homestead Bakery
St. Francis Hotel Noiseless System
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Colorings for Stucco that Improve with Age

Residence at Wakefield, Mass., stained with Cabot's Cement Stains. H. A. Perkins, Architect, Boston.

THIS residence in Wakefield, Mass., is one of a group of four fine buildings that were stained in 1911 with Cabot's Waterproof Cement Stains, and an examination of these buildings by an expert decorator in 1915 showed that the colors had become so soft and artistic in tone after their four years' exposure to the weather that the decorator advised the owners not to recolor the stucco when the other parts of the buildings were painted.

This confirmation of their claims that the Cement Stains would "grow old gracefully" in the same way that distinguished their celebrated Creosote Shingle Stains, has been most gratifying to the manufacturers who claim that the Waterproof Cement Stains are as peculiarly appropriate for stucco and all similar cement surfaces as their Shingle Stains are for shingles, siding and boarding. They also claim that the heavy, opaque coatings are not suitable for stucco for exactly the same reasons that common house paint is not suitable for shingles. The Cement Stains tint the surface without covering it or spoiling the natural texture of the stucco and they cannot crack or peel or scale off as a heavier, less suitable material is apt to do. These Stains cost less than any paints, they are far easier to apply and they cover a great deal more surface, so that in addition to their artistic and lasting qualities they are most economical, and they thoroughly and permanently waterproof the surface of the stucco.

The other illustrations show other characteristic examples of the type of buildings for which these Stains are peculiarly adapted.

Berkeley Lake City and Denver County Bath House Stained with Cabot's Stucco Stains E. H. Moorman, Architect, Denver, Colo.

Residence of R. C. Burnham, Richland Center, Wis. Percy D. Bentley, Architect, La Crosse, Wis. Stained with Cabot's Cement Stains

$300,000 for Railway Improvements

The Pacific Electric Company of Los Angeles expects to start work as soon as the board of public utilities issues the necessary permit, on the construction of additions to the elevated track in the rear of the Main street terminal. Changes will also be made at the Hill street terminal and the station building remodeled. The estimated cost of work is $340,000.

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W. C. Hays, Architect

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At least, it may be said to equal the natural product in appearance and crushing strength. This is not only the opinion of the Judges of the P. P. I. E., who gave to the American Portland Stone and Granite the highest award of its class—a gold medal—but the technical and building experts from all parts of the world, including the stone and granite men from our own section expressed the greatest surprise at these products, which they could not tell from the natural specimens shown at the Exposition. Even the French visitors, whose country has stood in the lead for artificial stone, say that they must now take a second place. This stone and granite could well be substituted where the natural products are specified for it is equally waterproof and durable. A running fountain started two months ago at the Fair and built of this material shows no leakage. Robert W. Hunt & Co.'s test shows a crushing strength of 2600 lbs. to square inch.

This material is adapted for walls, facing, foundations, pillars, steps, floor tile, wainscoting, fountains, lawn furniture, etc., also for electroliers. It is a California composition, being made of sand, crushed rock and local Portland cement, and is the result of some quarter of a century of practical tests and experiments. The American Portland Stone and Granite Co.'s factory in East Oakland is the largest of its kind in the U. S., and is equipped with all modern appliances and machinery. As it has been decided that these products can be set by brick layers, they can be used without reference to the granite cutters' strike.

Some recent contracts for American Portland Stone and Granite may be mentioned: First Presbyterian Church, Oakland; First M. E. Church, Oakland; Raymond Apartments, Oakland; Calkins Syndicate Building, San Francisco; Duncan Block, San Francisco;

Detail of Entrance, First M. E. Church, Oakland. Norman F. Marsh, Architect. Columns are of Portland Stone.

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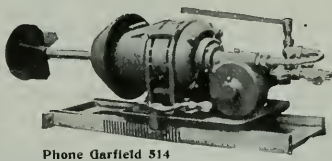

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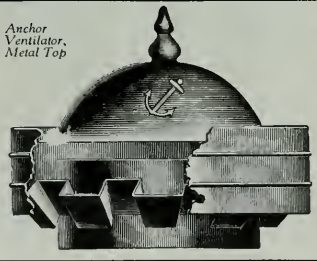

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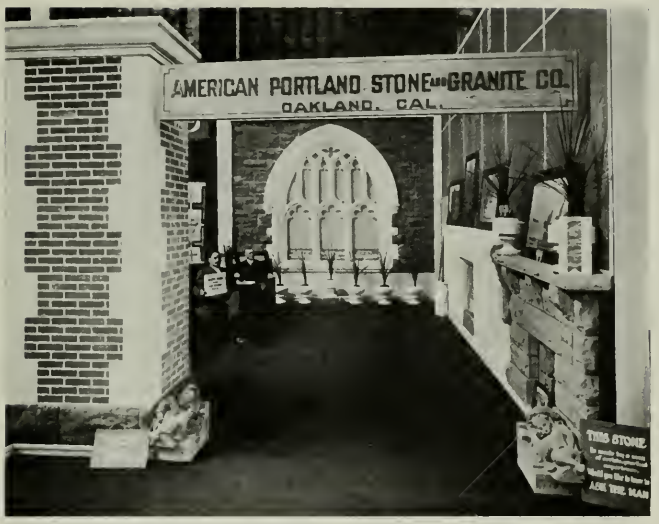

EXHIBIT OF AMERICAN PORTLAND STONE AND GRANITE CO. AT P. P. I. E.

Lodi City Hall; Wm. Ede Building, San Francisco.

The Company has a San Francisco office at 255 Monadnock Building, or may be addressed at its main office, foot 10th Avenue, East Oakland.

Section of workroom in American Portland Stone and Granite Co's factory, East Oakland.

Fireproof Building for Mission Street

It is stated on good authority that a fireproof building of from two to five stories will be erected on the lot at 1157 Mission street, San Francisco, formerly occupied by the cabinet works of T. H. Meek & Company, which were recently destroyed by fire. Messrs. Baldwin & Howell, 318 Kearny street, San Francisco, are said to be acting for the owners.

San Francisco to Have Permanent Building Material Exhibit

The coming year will find San Francisco the home of a Building Material Exhibit very similar, but possibly on a more elaborate scale, to exhibits maintained in Chicago, Los Angeles and other large cities. The San Francisco project is backed by abundant local capital and no money will be spared to give the exhibitors full return for their investment. The entire third and fourth floors of the Newman-Magnin building at Stockton and O'Farrell streets have been leased for a term of years and are now being fitted up preparatory to receiving the exhibits. A private entrance, with excellent elevator accommodations, has been put in on the O'Farrell street side. It is hoped to have the exhibit in operation early in January.

The promoters, Messrs. Simpson and Fisher, promise that every interest of the manufacturer and dealer in building materials and appliances will be advanced. The exhibit will be open to those in any way interested in building construction—owners, architects and contractors, and special facilities will be provided for receiving visitors from out of town.

Richmond City Hall

Plans for Richmond's new city hall are being prepared by Messrs. J. B. Ogborn and J. T. Narbett, associated. The building will cost $50,000.

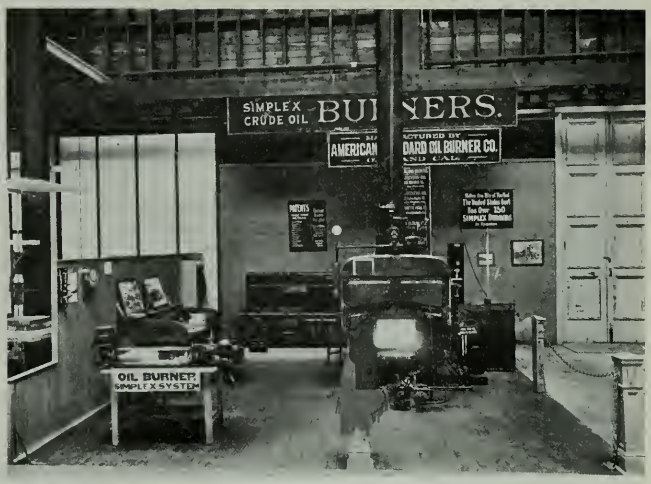

EXHIBIT OF AMERICAN STANDARD OIL BURNER COMPANY, P. P. I. E.

Hand Book Mechanical Atomization Crude Oil

The American Standard Oil Burner Company of Oakland, Cal., manufacturers of the Simplex Mechanical Oil Burners, report running their plant at capacity, shipping forty per month of their new horizontal rotary and twenty or thirty of their well known standard rotary.

They have lately brought out a safety pressure control valve that does away with the necessity of a no-voltage release switch, generally used on rotary burners, which adds to the safety and efficiency of their burners.

A new handbook on the subject of mechanical atomization of crude oil is just off the press and will be sent to architects and the heating and plumbing trade upon request.

A Modern Phoenix

Hardly had the smoke died away from the disastrous fire which swept from sight the T. H. Meek Company's plant, before Mr. Meek had pluckily and successfully installed himself in new offices at 1071 Mission street, equipped a new factory for his bank, store and office fixture business on 7th street, and announced to the building trade that he was ready for business. Such energy deserves recognition, and from what is known of Mr. Meek he can be depended upon to justify any confidence reposed in him at this or any other time. He has the undaunted courage characteristic of the San Francisco "knows how" citizen and revives recollections of the rapid rehabilitation which followed the great fire of 1906.

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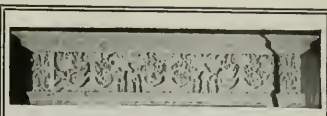

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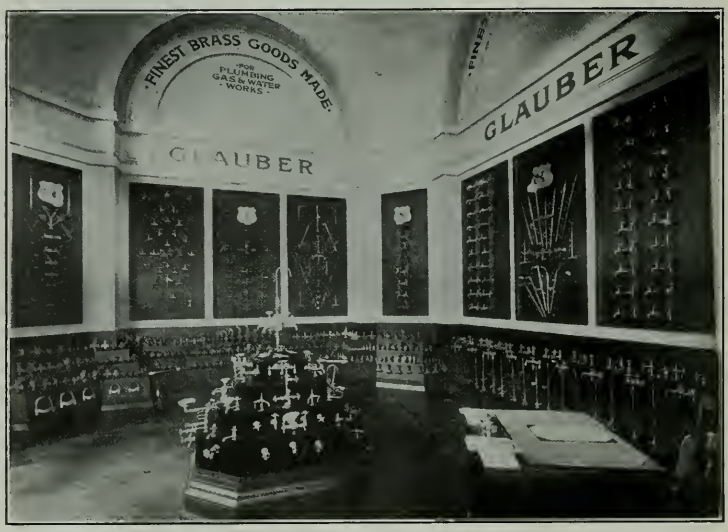


GLAUBER EXHIBIT AT THE P. P. I. E., SAN FRANCISCO

Glauber Awarded Seven Medals

The Glauber Brass Manufacturing Company of Cleveland, Ohio, of which Mr. M. W. Wuesthoff is Pacific Coast manager, has one of the most attractive exhibits in the Manufacturers Palace at the P. P. I. E. It is therefore not surprising that this company should be honored with seven medals by the Exposition jury. The medals were awarded as follows:

Glauber Self Closing Ball Bearing Faucet—medal of honor.

Glauber Nu Rapid Basin Cocks, Bibbs and Bath Cocks—medal of honor.

Glauber Drinking Fountains—medal of honor.

Glauber Fuller Basin Cocks, Bibbs and Bath Cocks—gold medal.

Glauber Compression Basin Cocks, Bibbs, Bath Cocks and Stops—gold medal.

Glauber Waterworks and Gas Works, brass goods—gold medal.

Glauber Nu Lock Cocks—silver medal.

More than 300 of the leading hotels and apartment houses on the Pacific Coast are equipped with Glauber Self Closing Basin Cocks and faucets, Glauber Nu Rapid Faucets. All sanitary rooms at the P. P. I. E. are fitted with Glauber Self Closing Basin Cocks also, and the Inside Inn is equipped with over 4500 pieces of Glauber brass goods.

The Glauber Brass Manufacturing Company calls attention to the millions of their faucets and specialties in use throughout the United States, Canada, Mexico, South America and Europe, including some of the largest public buildings, hospitals, asylums and penitentiaries.

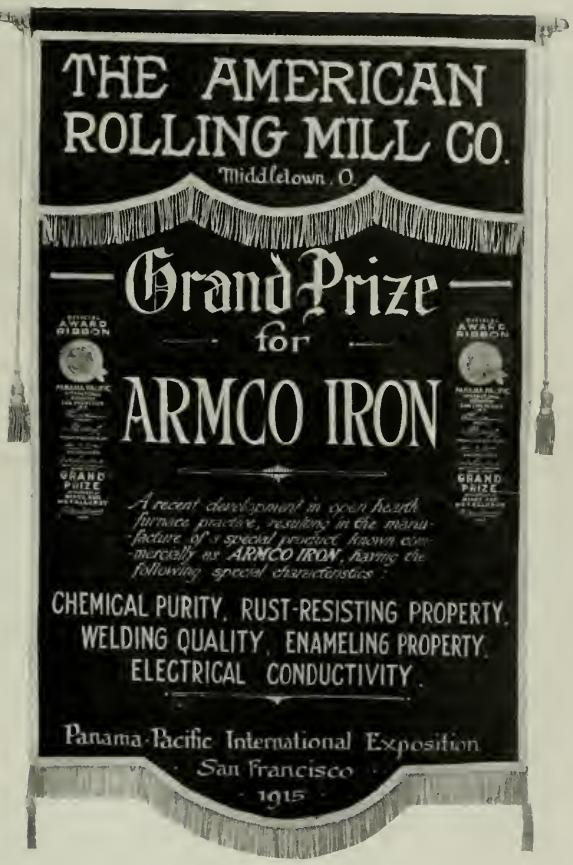
Architects and contractors are especially invited to visit this exhibit during the last month of the fair and inspect new types of faucets and plumbing appliances shown for the first time on the Pacific Coast.

City Planning for San Bruno

Mayor L. H. Traeger has appointed the following members of a city planning commission to arrange a campaign for the beautification and improvement of the city of San Bruno: J. J. Hearne, city trustee; Harry Loose, president of the San Bruno Merchants' Association; August Lund, city superintendent of streets; Henry Spaulding, clerk of the board of school trustees; W. J. Flynn, an active civic worker.

Cedar Posts Preserve

Several old square cedar posts used in building the first pier at Santa Monica were uncovered recently by workmen digging a trench alongside of the cement retaining wall at the foot of Colorado street. They are in a perfect state of preservation.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Tall Buildings of Marble

One of the western papers publishes a picture of a marble building now in construction and accompanies this with a description. In the course of the article it is stated that this will be the tallest classic marble structure in the world. The illustration shows the walls carried up as far as the cornice and the building is certainly not more than ten stories in height and appears to be only nine. The use of the term "classic" in this claim for magnitude may cover some reservation which we do not foresee. There are several marble buildings in New York City very much bigger and taller than this, and they seem to be equally entitled to be called "classic" in design. It is scarcely necessary to say that classical architecture did not provide for very tall buildings and in any sky-scraper the style must be freely modified. A nine- or ten-story marble building may well be worthy of note for its beauty, but it will scarcely bring fame to any city in these days merely by its height.—Stone.

Book Review

BUNGALOWS, CAMPS AND MOUNTAIN HOUSES, compiled by William Phillips Comstock, with an article by C. E. Schermerhorn, A. I. A.; second edition, revised; New York, William T. Comstock Company; illuminated cloth cover, 7½x10½ inches; 126 pages, 200 illustrations; price, $2.00.

This latest edition of a work which has met with popular appreciation, contains eighty designs of bungalows, representing the work of thirty-two different architects who have given attention to this class of design. There is an introduction to the subject written by William T. Comstock, which appeared in the first edition. Following, there is a special article on planning the bungalow by Mr. Schermerhorn, an architect who possesses great ability in planning. Accompanying his text there are numerous small diagrams, suggestive of convenient arrangements in the house and a plate showing twenty-two different schemes for the arrangement of the rooms of a bungalow. There are three main divisions of the book. The first illustrates bungalows proper with many excellent designs. The second gives bungalows of cottage type, these having rooms in the second story. The third division is on camps, lodges, and log cabins and contains many fine illustrations of attractive summer houses for the shore, woods and mountains. There are a number of detail plates showing construction which are of great value, as they give the best ideas of a number of our cleverest architectural designers.

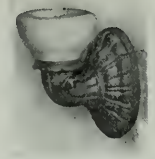
School Contractor Starts Something

The Berkeley Gazette printed the following:

John B. McCulloch, clerk of the Albany school board, living at 915 Curtis street, undertook to make an inspection of the new school at Vine and Shattuck with a view to getting some pointers on sanitation which he might recommend to his own town.

"Get out of here," said Dan Maddox, the foreman for W. D. Henderson, the contractor. McCulloch refused to go and Maddox threw him out.

McCulloch was persistent and tried again with the same result. Then McCulloch took his grievance to the police station. Mayor Irving sent word to Contractor Henderson that an apology must be forthcoming to McCulloch or a warrant would probably be issued for the arrest of Maddox.



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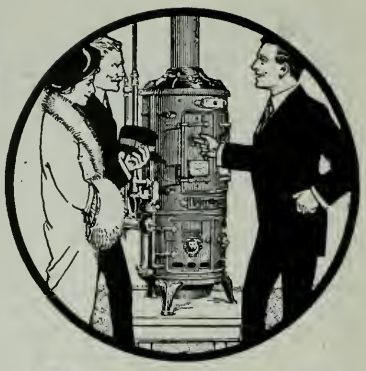

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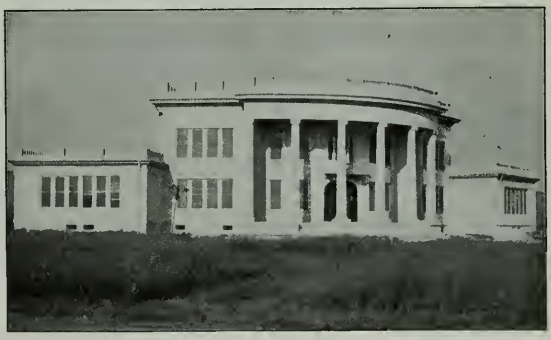

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Red Stock Brick, $14.00 to $16.00 per M.
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White Cement: Atlas, $6.00; Medusa, $6.00 per bbl.
Sand and Gravel mixed, 70c per ton, F.O.B. cars.
Sand (washed, screened river sand) 65c per ton, F.O.B. cars.
Bank Sand, $1.00 per cu. yd.
Roofing Gravel, $1.40 per ton.
Crushed Rock or Gravel, 75c per ton.
Red Roofing Tile, $22.00 to $25.00 per square, laid.
Brick Lime, $1.35 per bbl., C/L.
Finish Lime, $1.50 per bbl., C/L.
Hardwall Gypsum Plaster, $11.00 per ton, carload; 1150 per ton, ex. warehouse.
Oregon Pine, Rough Common, 1 x 3 to 1 x 10, $13.00.
Oregon Pine, Rough, 2 x 3 to 2- 12, $15.00.
Oregon Pine 1 x 4 T. & G. Flooring, No. 1, $31 per M; No. 2, $28; No. 3, $24.
Oregon Pine T. & G. Ceiling, No. 1 and 2 mixed, $26 to $28.
Redwood, Rough Common, 1 x 4 and up, $20.00.
Redwood, Rough Common, 2 x 3 to 2 x 10, $20.00 to $22.00.
Redwood Rustic, No. 1, $35.00; No. 2, $32.00.
Redwood Ceiling, No. 1, $29.00; No. 2, $26.00.
Redwood Shingles, No. 1, $2.40 full count.
Red Cedar Shingles, Star-A-Star, $2.40 full count.
Pine Lath, $2.40 per M.
Metal Lath, 13 to 25c per yd., according to quality.
1 x 3 Oak Flooring, Q. S. Clear, $116.00 per M; Select $75.00 per M.
½ x 2¼ Oak Flooring, Q. S. Clear, $96.00 per M; Select, $74.00 per M.
1 x 3 Maple Flooring Clear, $71.00 per M; Clear White, $85.00 per M.
White Lead in Oil, 8¼c per lb.
Dry Red Lead, 8c per lb.
Boiled Linseed Oil, 74c gal. Raw Linseed Oil, 72c gal.
Turpentine, per gallon, 63 to 70c in bbls.
Dry Shellac, 33c per lb., variable.
Hyloplate Blackboard, 25 to 35c per foot, installed.
Composition Flooring, 25 to 30c per foot, laid.
Genuine Slate Blackboards, 40 to 50c per foot, erected.

LOS ANGELES PRICES

Common Red Brick, No. 2, $4.50 per M.
Clinker Brick, $9.00 per M.
Pressed Brick, $35.00 per M.
Enameled Brick, $65.00 per M.
Red Roofing Tile, $12.00 and $15.00 per square (not laid).
White Cement, $6.00 per bbl.
Portland Cement, $2.30 per bbl.
Lime, $1.30 to $1.75 per bbl.
Hardwall Plaster, per ton, $9.90 ex. whse.
Oregon Pine, Rough Common, 1 x 3 up, $19.00 to $22.00 per M.
Oregon Pine, Rough Common, 2 x 3 up, $17.00 to $21.00 per M.
Oregon Pine Flooring, 1 x 4, No. 1, $40.00; No. 2, $35.00; No. 3, $22.50 per M.
Oregon Pine Ceiling, 1 x 4, No. 1, $36.00; No. 2, $31.00.
Redwood, Rough Common, $20.00 to $24.00.
Redwood Rustic, No. 1, $38.00; No. 2, $33.00 per M.
Redwood Ceiling, 1 x 4, No. 1, $33.00; No. 2, $28.00 per M.
Redwood Shingles, 4 bdls. to M, No. 1, $2.25; No. 2, $1.75.
Red Cedar Shingles, 4 bdls. to M, Star-A-Star, $2.75.
Pine Lath, 1½ in. x 4 ft., $3.25 per M; 1⅜ in. x 4 ft., $3.65 per M.
White Lead in Oil, 8¼c per lb.
Red Lead, dry, 8½c per lb.
Raw Linseed Oil, bbls., 65c gallon.
Boiled Linseed Oil, bbls., 68c gallon.
Turpentine, bbls., 63 to 70c. gallon.
Crushed Rock and Gravel, $1.65 per yard.
Sand, 85c per yard.

SACRAMENTO PRICES

Common Brick, $7.00 per M, C/L.
Pressed Brick, Wire Cut, $30.00 per M, C/L
Portland Cement, $2.40 per bbl. carloads.
Crushed Rock and Gravel, 85c per ton, ex. cars.
Sand, $1.00 yd. on cars.
Roofing Gravel, $1.50 per ton.
Lime, $1.35 bbl.
Hardwall Plaster, $13.00 per ton, ex. whse.

STOCKTON PRICES

Common Brick, $7.75 per M, del.
Face Brick, Wire Cut, $31.00 per M C/L.
Cement, $2.40 per bbl., C/L.
Crushed Rock and Gravel, 90c ton.
Sand, 90c.
Roofing Gravel, $1.50 per ton.
Lime, $1.35.
Hardwall Plaster, $13.00 ex. whse. per ton.

FRESNO PRICES

Common Brick, $9.50 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.84 per bbl., C/L.
Crushed Rock and Gravel, $1.35 per ton.
Black Face Brick, $25.00 per M—F. O. B.
Sand, $1.00 per yd., del.
Roofing Gravel, $1.85 per ton.
Lime, $1.50 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

BAKERSFIELD PRICES

Common Brick, $9.00 per M, del.
Face Brick, Wire Cut, $37.00 per M, C/L.
Cement, $2.77 per bbl., C/L.
Crushed Rock and Gravel, $1.80 per ton.
Sand, $1.00 per yd., del.
Roofing Gravel, $2.00 per ton.
Lime, $1.50 per bbl.
Hardwall Plaster, $15.00 per ton, ex. whse.

NORTHERN CALIFORNIA POINTS

Common Brick, $11.00 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.65 per bbl.
Crushed Rock and Gravel, 85 to 90c per ton, C/L.
Sand, $1.00 per yard.
Roofing Gravel, $1.50 per ton.
Lime, $1.40 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

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All of which goes to show that it is now a good time to advertise. Let people know what you have to sell and where they can get it. In this regard the Missouri editor, who compared the codfish and the hen in a poetic masterpiece, proved beyond a doubt that it pays to advertise. Here is his argument:

The codfish lays a million eggs,
While the helpful hen lays one;
But the codfish does not cackle
To inform us what she's done;
And so we scorn the codfish coy,
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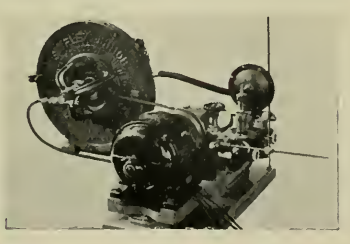

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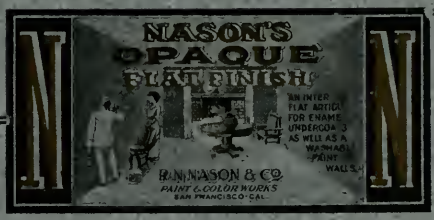
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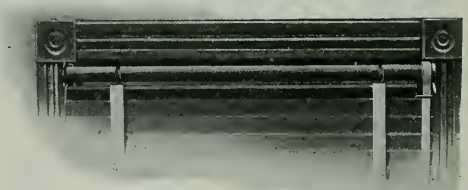

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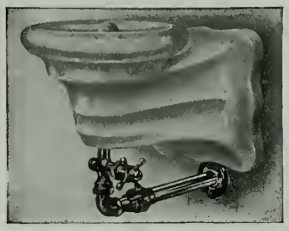

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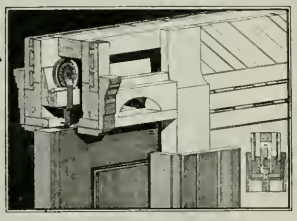

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Hicks-Judd Company, 51-65 First St., San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 589 Mission St., San Francisco.

BRICK—PRESSED, PAVING, ETC.
Diamond Brick Co., Balboa Bldg., San Francisco.
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Steiger Terra Cotta & Pottery Works, Mil. Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

BRICK AND CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
Wadsworth, Howland & Co., Inc. (See Ads for Pacific Coast Agents.)
Trus-Con Par-Seal, made by Trussed Concrete Steel Co., Youngstown, O.
Glidden Products, sold by Whittier-Coburn Co., Howard and Beale Sts., San Francisco; California Glass & Paint Company, Los Angeles.
Paraffine Paint Co., 34 First St., San Francisco.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.
Russell & Erwin Mfg. Co., Commercial Bldg., San Francisco.

BUILDING MATERIAL, SUPPLIES, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco.
Western Builders' Supply Co., 155 New Montgomery St., San Francisco.
C. F. Pratt Building Material Co., Hearst Bldg., San Francisco.
C. Jorgensen, 356 Market St., San Francisco.

CAEN STONE—IMITATION
A. Knowles, 985 Folsom St., San Francisco.

CEDAR
Van Arsdale-Harris Lumber Co., Fifth and Brannan Sts., San Francisco.
Tilden Lumber Co., foot of University avenue, Berkeley.

CEMENT
Atlas Portland Cement Co., represented by United Materials Co. and Pacific Portland Cement Company, San Francisco.
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.
Medusa White Portland Cement, sold by Building Material Co., Inc., Monadnock Bldg., San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing Agents on page 30.)
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.
L. & S. Cement Paint, manufactured by Paint Products Corporation, 524 Sharon Bldg., San Francisco.

"GRANT CONCRETE MIX" The only properly proportioned mix in this market. Composed of hard, clean, fresh-water gravel, free from sand stone, and contains about 25% of crushed rock and necessary amount of sand.

WE GUARANTEE LESS THAN 25% VOIDS.

Used on many important first-class buildings and road work. Accepted on all City, State and U. S. Government work.

GRANT GRAVEL COMPANY

FLATIRON BLDG., Phone Sutter 1582, SAN FRANCISCO

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Pioneer Roofing
Made in California
Pioneer Paper Co.
513 HEARST BLDG., SAN FRANCISCO Telephone Kearny 3788

Covers New State Piers 18, 24 and 37 on San Francisco Water Front.

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CEMENT EXTERIOR WATERPROOF COATING —Continued.
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
Imperial Waterproofing, manufactured by Imperial Co., 183 Stevenson St., San Francisco.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co., Youngstown, O.
Paraffine Paint Co., 34 First St., San Francisco.

CEMENT EXTERIOR FINISH
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 30.)
Concreta, sold by W. P. Fuller & Co., all principal Coast cities.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., San Francisco.
Concrete Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 30.)
Fuller's Concrete Floor Enamel, made by W. P. Fuller & Co., San Francisco.
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—GRAVITY SPIRAL
Insley Gravity System for pouring concrete, represented by Garfield Myers, Hearst Bldg., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORING
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
"Kompolith," sold and laid by John King & Sons, 36 Stanford street, San Francisco.
Magnesite Flooring, laid by National Roofing Company, Plaza Bldg., Oakland.

COMPRESSED AIR CLEANERS
Spencer Turbine Cleaner. Sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
Invincible Vacuum Cleaner, sold by R. W. Foyle, 416 Harriet St., San Francisco.
Tuec., mfrd. by United Electric Company, 556 Sutter St., San Francisco, and 724 S. Broadway, Los Angeles.

CONCRETE CONSTRUCTION
American Concrete Co., Humboldt Bank Bldg., San Francisco.
Clinton Construction Co., Mutual Bank Bldg., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
P. A. Palmer, Monadnock Bldg., San Francisco.

CONCRETE MACHINERY
Garfield Myers, factory representative of Insley Manufacturing Company, and Marsh-Capron Company, Hearst Bldg., San Francisco.

CONCRETE MIXERS
Austin Improved Cube Mixer. Factory branch. 473-485 Sixth St., San Francisco.
Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE PILES
McArthur Concrete Pile Company, Chronicle Building, San Francisco.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
"Kahn System," see advertisement on page 23, this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., San Francisco.
Triangle Mesh Fabric. Sales Agents, Pacific Building Materials Co., 523 Market St., San Francisco.
Twisted Bars, sold by Woods, Huddart & Gunn, 444 Market St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco, and Union Oil Bldg., Los Angeles.

CONCRETE SURFACING
"Concreta" sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating, sold by Jas. Hambly Co., Pacific Bldg., San Francisco and Los Angeles.
Glidden Liquid Cement, manufactured by Glidden Varnish Co., Whittier, Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.

PACIFIC PLATE BLACKBOARD

School Supplies Auditorium Seating
School Desks School Furniture
Factory Prices—San Francisco Service
THE A. H. ANDREWS CO.
728 Mission Street San Francisco
508-1st Ave. South Seattle

Supersedes Marble and Tile - - - **VITROLITE** A fire-polished, non-absorbent, water-proof, acid-proof, stainless, pure-white sanitary material for structural use

"Cleaned Without Scrubbing" Estimates promptly furnished for the complete installation of VITROLITE in any structure, room, bath or kitchen

Oakland Office
1813 TELEGRAPH AVE.
Phone Oakland 589

Vitrolite Construction Co.

34 DAVIS ST.
San Francisco
Phone Garfield 2680

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL

American Concrete Co., Humboldt Bank Bldg., San Francisco.
Commary-Peterson Co., Inc., Bankers Investment Bldg., San Francisco.
Geo. H. Bos, Hearst Bldg., San Francisco.
Larsen, Sampson & Co., Crocker Bldg., San Francisco.
Clinton Construction Company, 211 Mutual Bank Bldg., San Francisco.
Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
Collman & Collman, 526 Sharon Bldg., San Francisco.
Construction & Engineering Co., 1047 Folsom St., San Francisco.
M. Fisher, 863 Mission St., San Francisco.
Van Sant, Houghton Co., Hooker & Lent Bldg., San Francisco.
Howard S. Williams, Hearst Bldg., San Francisco.
Harvey A. Klyce, Sheldon Bldg., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
Lester Stock, Hearst Bldg., San Francisco.
Masow & Morrison, 518 Monadnock Bldg., San Francisco.
John Monk, 216 Sharon Bldg., San Francisco.
Monson Bros., 1907 Bryant St., San Francisco.
Robert Trost, 26th and Folsom Sts., San Francisco.
Western Building & Engineering Co., new Call Bldg., San Francisco.
Williams Bros. & Henderson, Holbrook Bldg., San Francisco.

CORK TILING, FLOORING, ETC.

"Linotile," manufactured by Armstrong Cork & Insulation Company. M. C. Van Fleet, agt., 120 Jessie St., San Francisco.
David E. Kennedy, Inc., 120 Jessie St., San Francisco.

CORNER BAR

Dolbear Curb Bar, manufactured by American Steel Bar Co., 1034 Merchants Exchange Bldg., San Francisco.

CORNER BEAD

Capitol Sheet Metal Works, 1827 Market St., San Francisco.
United States Metal Products Co., 525 Market St., San Francisco.; 750 Keller St., San Francisco.

CRUSHED ROCK

Grant Gravel Co., Flat Iron Bldg., San Francisco.
Niles Rock, sold by California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.

DAMP-PROOFING COMPOUND

Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Imperial Co., 183 Stevenson St., San Francisco.
Trus-Con Damp Proofing. (See advertisement of Trussed Concrete Steel Company for Coast agencies.)
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS

McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Portland Wire & Iron Works.

DRINKING FOUNTAINS

Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
J. B. Clow & Son, Hearst Bldg., San Francisco.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Wittman Lyman & Co., 341 Minna St., San Francisco.

DUMB WAITERS

Spencer Elevator Company, 173 Beale St., San Francisco.

ELECTRICAL CONTRACTORS

Butte Engineering Co., 683 Howard St., San Francisco.
Boynton Electric Co., 504 Rialto Bldg., San Francisco.
Central Electric Co., 618 Mission St., San Francisco.
Ne Page, McKenny Co., 401 Hearst Building, San Francisco.
Newbery Electrical Co., Humboldt Bank Bldg., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
H. S. Tittle, 245 Minna St., San Francisco.
Rex Electric and Construction Co., Inc., 1174 Sutter St., San Francisco.
Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS

Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER

The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

MORTENSON CONSTRUCTION CO.

CONTRACTORS FOR STRUCTURAL STEEL AND IRON

H. MORTENSON, PRES. CHAS. G. MORTENSON, VICE-PRES. AND MGR.

OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS

PHONE: MISSION 5033 SAN FRANCISCO, CAL.

Tile Roofing--Slate Roofing

Fibrestone & Roofing Company

Telephone Sutter 329 — 971 Howard St., SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.
B. C. Van Emon Elevator Co., 235 First St., San Francisco.

ELEVATOR ENCLOSURES
J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

ENGINEERS
W. W. Breite, Clunie Bldg., San Francisco.
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

FIRE EXIT DEVICES
Russell & Erwin Mfg. Co., Commercial Bldg., San Francisco.

FIRE ESCAPES
Burnett Iron Works, Fresno, Cal.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIREPROOF PAINT
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.
W. P. Fuller & Co., all principal Coast cities.
Guido Blenio Fireproofing Co., Inc., 605 Sharon Bldg., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. H. Andrews, 728 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison streets, San Francisco.
Fink & Schindler, 218 13th St., San Francisco.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLAG POLE TOPS
Bolander & Hallawell, 270 First St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., San Francisco.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES
Torrid Zone furnace sold and installed by Modern Sheet Metal Works, 731 Clement St., San Francisco.

GAS FURNACES
Cole Gas Furnace, Cole Heater Sales Co., Lick Bldg., San Francisco, 1764 Broadway, Oakland.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier-Coburn Co., Howard & Beale Sts., San Francisco.

GRANITE
American Portland Stone and Granite Co., foot of Tenth Ave., E. Oakland.
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Division and Potrero Sts., San Francisco.
McGilvray-Raymond Granite Co., 634 Townsend St., San Francisco.

GRAVEL, SAND AND CRUSHED ROCK
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
American Keene Cement Co., 333 Monadnock Bldg., San Francisco.

HARDWARE
Corbin Hardware sold by Baker & Hamilton, San Francisco and Los Angeles.
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.
Russell & Erwin Manufacturing Co., Commercial Bldg., San Francisco.

MADE IN SAN FRANCISCO

PASSENGER and FREIGHT ELEVATORS

INVESTIGATE OUR PRODUCT

SPENCER ELEVATOR COMPANY

126-128 Beale Street, SAN FRANCISCO — Phone Kearny 664

A FLOORING for Discriminating Architects

For Hotels, Schools, Hospitals and Residences

STRABLE MANUFACTURING CO.

511-537 First Street **OAKLAND, CAL.**

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD FLOORING
- Parrott & Co., 320 California St., San Francisco
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Strable Manufacturing Company, Oakland, California.

HARDWOOD LUMBER
- Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
- Parrott & Co., 320 California St., San Francisco.
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Strable Manufacturing Company, Oakland, California. (See advertisement above.)

HEATERS—AUTOMATIC
- Pittsburg Water Heater Co., 237 Powell St., San Francisco.
- Hoffman Heater Company, 429 Stockton St., San Francisco.

HEATING AND VENTILATING
- American Heat & Power Co., Oakland, Cal.
- Fess System Co., 220 Natoma St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Mangrum & Otter, Inc., 507 Mission St., San Francisco.
- Modern Sheet Metal Works, 731 Clement St., San Francisco.
- Charles T. Phillips, Pacific Building, San Francisco.
- M. & W. Rotary Oil Burner, manufactured by Industrial Equipment Co., 527 Howard St., San Francisco.
- William F. Wilson Co., 328 Mason St., San Francisco.
- Scott Company, 243 Minna St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
- Petersen-James Co., 730 Larkin St., San Francisco.
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.

HEAT REGULATION
- G. E. Witt Company, Inc., 850 Howard St., San Francisco.
- Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
- Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento, and Chamber of Commerce Bldg., Portland.

HOSPITAL FIXTURES
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.

INGOT IRON
- "Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
- Robert W. Hunt & Co., 251 Kearny St., San Francisco.

JOIST HANGERS
- Western Builders' Supply Co., 155 New Montgomery St., San Francisco.

KEENE CEMENT
- American Keene Cement Co., Monadnock Bldg., San Francisco.

LAMP POSTS
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.

LIME
- Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.

LIGHT, HEAT AND POWER
- Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Sunset Lumber Co., Oakland, Cal.
- Santa Fe Lumber Co., Seventeenth and De Haro Sts., San Francisco.
- E. K. Wood Lumber Company, East Oakland, California.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
- Tilden Lumber Company, foot of Unversity Ave., Berkeley, Cal.
- Van Arsdale-Harris Lumber Company, Fifth and Brannon Sts., San Francisco.

MILL WORK
- Dudfield Lumber Co., Palo Alto, Cal.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.

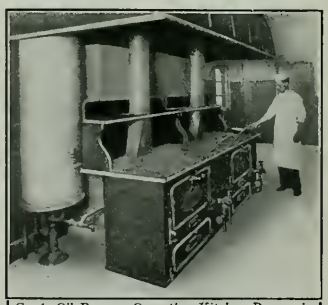
MAIL CHUTES
- Cutler Mail Chute Co., Rochester, N. Y. (See Adv. on page 28 for Coast representatives.)

MANTELS
- Mangrum & Otter, 561 Mission St., San Francisco.
- Oakland Mantel Co., 2148 Telegraph Ave., Oakland.

METAL CEILINGS
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
- U. S. Metal Products Co., 525 Market St., San Francisco.
- Capitol Sheet Metal Works, 1927 Market St., San Francisco; 117 Franklin St., Oakland.

METAL FURNITURE
- Capitol Sheet Metal Works, San Francisco and Oakland.
- A. H. Andrews Co., 728 Mission St., San Francisco.



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ARCHITECTS' SPECIFICATION INDEX—*Continued*

METAL SHINGLES
- Meurer Bros., 630 Third St., San Francisco.
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

OIL BURNERS
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- American Standard Oil Burner Co., Seventh and Cedar Sts., Oakland.
- W. S. Ray Manufacturing Company, 218 Market St., San Francisco.
- Fess System Co., 220 Natoma St., San Francisco
- M. & W. Oil Burner, manufactured by Industrial Equipment Co.,
- T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
- Rotary Oil Burner Company, 159 Twelfth St., Oakland.
- G. E. Witt Oil Burner Company, 850 Howard St., San Francisco.

ORNAMENTAL IRON AND BRONZE
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Brode Iron Works, 31-37 Hawthorne St., San Francisco.
- Burnett Iron Works, Fresno.
- Palm Iron & Bridge Works, Sacramento.
- J. G. Braun, Chicago and New York.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., Sain Francisco.
- Shreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINTING AND DECORATING
- D. Zelinsky, 564 Eddy St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). (See Adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Trus-Con Stone Tex., Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Concreto Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Trus-Con Bar-Ox, Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Bay State Steel Protective Coating. (See page 30 for coast agents.)
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, represented in San Francisco by Marion D. Cohn Co., Hansford Building.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., San Francisco, and California Glass & Paint Company, Los Angeles.
- Jones-Duncan Paint Co., 414 Ninth St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 113 Front St., San Francisco.

PHOTO ENGRAVING
- California Photo Engraving Co., 121 Second St., San Francisco.

PHOTOGRAPHY
- R. J. Waters Co., 717 Market St., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- Pratt Building Material Co., Hearst Bldg., San Francisco.
- Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PLASTER CONTRACTORS
- A. Knowles, 985 Folsom St., San Francisco.
- C. C. Morehouse, Crocker Bldg., San Francisco.
- Hermann Bosch, 2054 Market St., San Francisco.

PLUMBING CONTRACTORS
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Petersen-James Co., 730 Larkin St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Alex Coleman, 706 Ellis St., San Francisco.

PLUMBING FIXTURES, MATERIALS, ETC.
- J. B. Clow & Son, Hearst Bldg., San Francisco.
- Crane Co., Second and Brannan Sts., San Francisco.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Improved Sanitary Fixture Co., 612 Metropolitan Bldg., Los Angeles.
- Miller-Enwright Company, Sacramento, Cal.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Western States Porcelain Co., San Pablo, Cal.
- Wm. F. Wilson Co., 328 Mason St., San Francisco
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.
- Bashlin Faucets, sold by Brockmann Supply Co., 320 Market street, San Francisco.

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J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PUMPS
Cbicago Pump Company, 612 Howard street, San Francisco.

RADIATORS
"Presto" Sanitary Radiators (see page 28 for Pacific Coast Agents.)

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

REVERSIBLE WINDOWS
Hauser Reversible Window Company, Balboa Bldg., San Francisco.

REVOLVING DOORS
Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco .
C. F. Weber & Co., 365 Market St., San Francisco.
Kinnear Steel Rolling Doors, W. W. Thurston, agent, Rialto Bldg., San Francisco.
Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
Grant Gravel Co., Flat Iron Bldg., San Francisco.
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
National Roofing Company, Plaza Bldg., Oakland.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Building, San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

ROOFING TIN
Meurer Bros., A. H. MacDonald, agent, 630 Third St., San Francisco.

SANITARY DRINKING FOUNTAINS
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Haws' Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley.
J. B. Clow & Son., Hearst Bldg., San Francisco.

SASH CORD
Samson Cordage Works, manufacturers of Solid Braided Cords and Cotton Twines, 88 Broad St., Boston, Mass.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
A. H. Andrews & Co., 728 Mission St., San Francisco.

SCHOOL FURNITURE AND SUPPLIES—Cont'd
Whitaker & Ray-Wiggin Company, 776 Mission St., San Francisco.

SEWAGE EJECTORS
Chicago Pump Co., represented by Telephone Electric Equipment Co., 612 Howard street, San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Capitol Sheet Metal Works, 1927 Market St., San Francisco.
U. S. Metal Products Co., 525 Market St., San Francisco.
Modern Sheet Metal Works, 731 Clement St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SLATE ROOFING
Fiberstone & Roofing Co., 971 Howard St., San Francisco.

STEEL AND IRON—STRUCTURAL
Burnett Iron Works, Fresno, Cal.
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Brode Iron Works, 31 Hawthorne St., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Western Iron Works, 141 Beale St., San Francisco.
Woods, Huddart & Gunn, 444 Market St., San Francisco

STEEL PRESERVATIVES
Bay State Steel Protective Coating. (See page 30 for coast agents.)
Wadsworth, Howland & Co., Boston Mass. (See Adv. for Coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.

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The American Hardware Corporation, Successor

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL BARS FOR CONCRETE
- Kahn and Rib Bars, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Woods, Huddart & Gunn, 444 Market St., San Francisco.
- Pacific Coast Steel Co., Rialto Bldg., San Francisco, and Union Oil Company, Los Angeles.

STEEL MOULDINGS FOR STORE FRONTS
- J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

STEEL FIREPROOF WINDOWS
- United States Metal Products Co., San Francisco and Los Angeles.

STEEL ROLLING DOORS
- Kinnear Steel Rolling Door Co., W. W. Thurston, Rialto Bldg., San Francisco.

STEEL WHEELBARROWS
- Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
- American Portland Stone and Granite Co., foot of Tenth Ave., East Oakland.
- California Granite Co., 518 Sharon Bldg., San Francisco.
- Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
- Colusa Sandstone Co., Potrero Ave. and Division St., San Francisco.
- McGilvray Stone Company, 634 Townsend St., San Francisco

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
- S. F. Bowser & Co., 612 Howard St., San Francisco.

SURETY BONDS
- California Casualty Company, Merchants' Exchange Bldg., San Francisco.
- Globe Indemnity Co., Insurance Exchange Bldg., San Francisco.
- Fidelity & Deposit Co. of Maryland, Mills Bldg., San Francisco.
- Pacific Coast Casualty Co., Merchants' Exchange Bldg., San Francisco.

TEMPERATURE REGULATION
- Johnson Service Company, 149 Fifth St., San Francisco.
- G. E. Witt Company, Inc., 850 Howard St., San Francisco.

THEATER AND OPERA CHAIRS
- A. H. Andrews, 728 Mission St., San Francisco.
- C. F. Weber & Co., 365 Market St., San Francisco.
- Whitaker & Ray-Wiggin Company, 776 Mission St., San Francisco.

TELEPHONE EQUIPMENT
- Telephone Electric Equipment Co., 612 Howard St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
- Mangrum & Otter, 561 Mission St., San Francisco.
- Oakland Mantel Co., 2148 Telegraph Ave., Oakland.

TILE FOR ROOFING
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
- Denison Hollow Interlocking Blocks, Forum Building, Sacramento.

VITREOUS CHINAWARE
- Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

VACUUM CLEANERS
- Invincible Vacuum Cleaner, R. W. Foyle, Agent, San Francisco.
- Spencer Turbine Cleaner, sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
- "Tuec" Air Cleaner, manufactured by United Electric Co., 110 Jessie St., San Francisco.

VALVES
- Jenkins Bros., 247 Mission St., San Francisco.

VARNISHES
- W. P. Fuller Co., all principal Coast cities.
- Glidden Varnish Co., Cleveland, O., represented on the Pacific Coast by Whittier-Coburn Co., San Francisco.
- R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
- Standard Varnish Works, 113 Front St., San Francisco.
- S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
- C. F. Weber & Co., 365 Market St., San Francisco.

WALL PAINT
- San-A-Cote and Vel-Va-Cote, manufactured by the Brininstool Co., Los Angeles; Marion D. Cohn Co., Hansford Bldg., San Francisco, distributor.

WALL BEDS
- Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BOARD
- "Amiwud" Wall Board, manufactured by Parafline Paint Co., 34 First St., San Francisco.

WATER HEATERS—AUTOMATIC
- Pittsburg Water Heater Co. of California, 237 Powell St., San Francisco, and Thirteenth and Clay Sts., Oakland.
- Hoffman Heater Co., 429 Stockton St., San Francisco.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
- Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
- Concreto Cement Coating, manufactured by the Muralo Co. (See page 5.)
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- Glidden's Concrete Floor Dressing and Liquid Cement Enamel, sold on Pacific Coast by John King & Sons, 36 Stanford St., San Francisco.
- Whittier, Coburn Company, San Francisco, and California Glass & Paint Company, Los Angeles.
- Imperial Co., 183 Stevenson St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
- Wadsworth, Howland & Co., Inc. (See Adv. for Coast agencies.)

WHEELBARROWS—STEEL
- Western Iron Works, Beale and Main Sts., San Francisco.

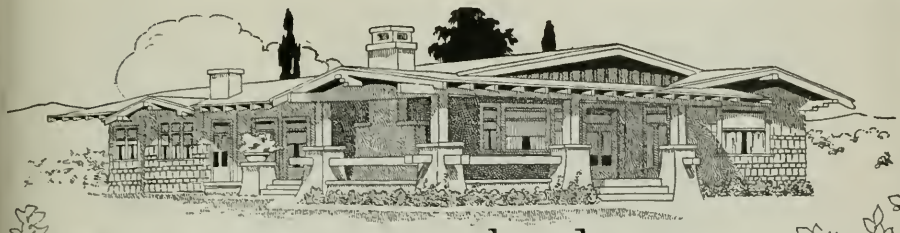
WHITE ENAMEL FINISH
- "Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
- "Silkenwhite," made by W. P. Fuller & Co., San Francisco.
- "Satinette," Standard Varnish Works, 113 Front St., San Francisco.
- Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Co. (See Adv. for Coast distributors.

WINDOWS—REVERSIBLE, ETC.
- Hauser Reversible Window Co., Balboa Bldg., San Francisco.

WINDOW SHADES
- Top Light Shade Co., 737 Market St., Oakland.

WIRE FABRIC
- U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
- Fink & Schindler, 218 13th St., San Francisco.
- Mangrum & Otter, 561 Mission St., San Francisco.



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A roof or a shingled house will stand exposure for years if a *good* shingle stain has been applied.

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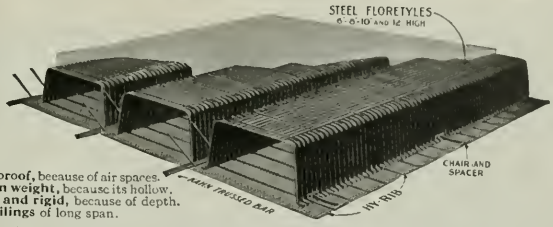

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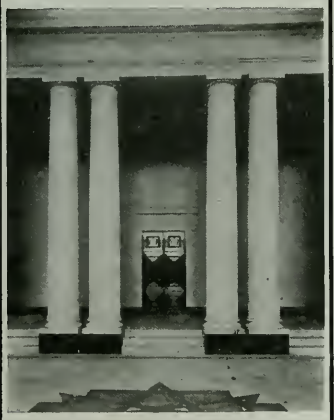

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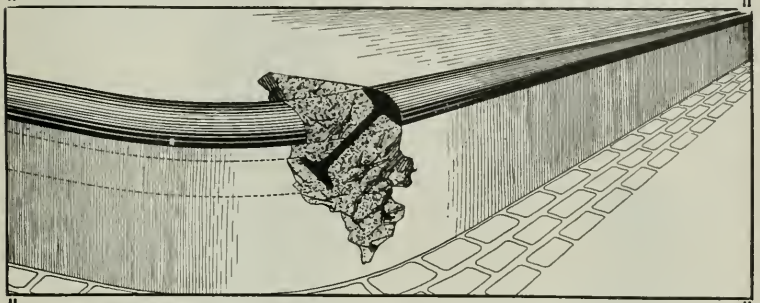

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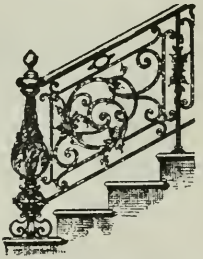

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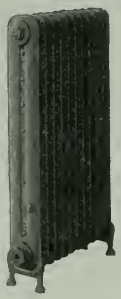

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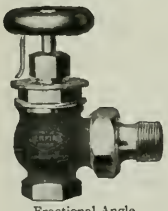

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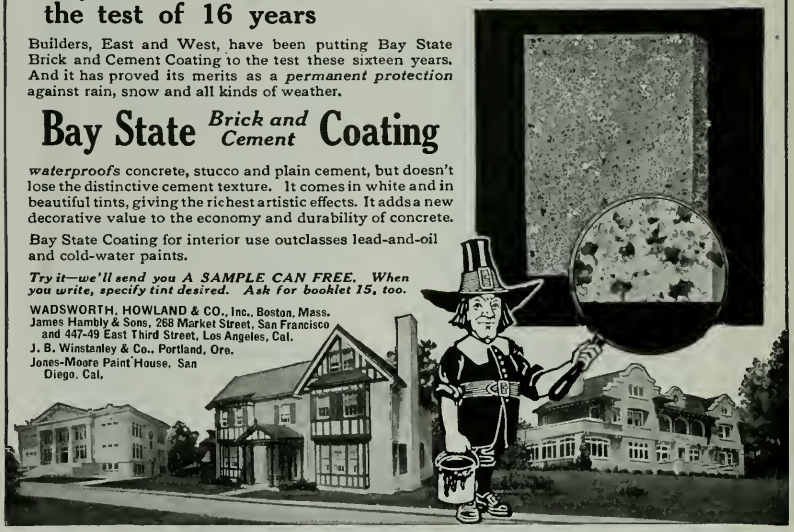

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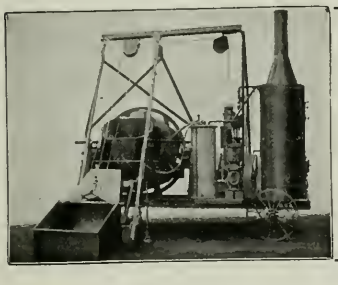

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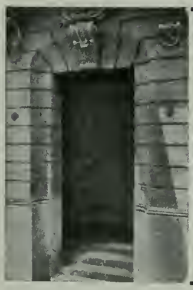

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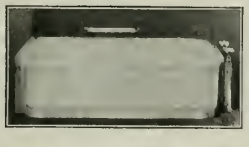

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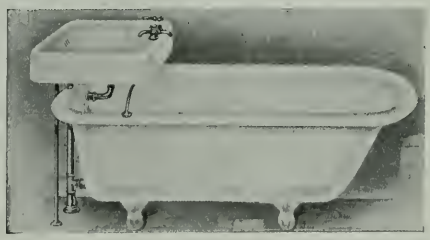

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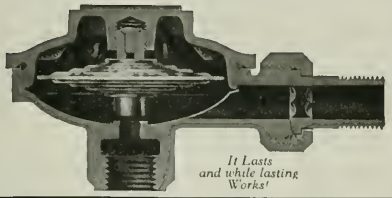

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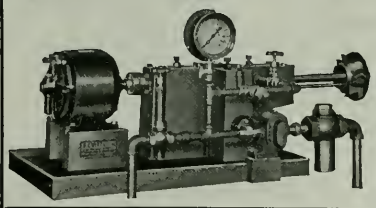

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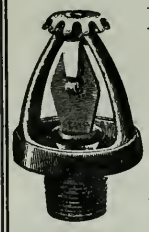

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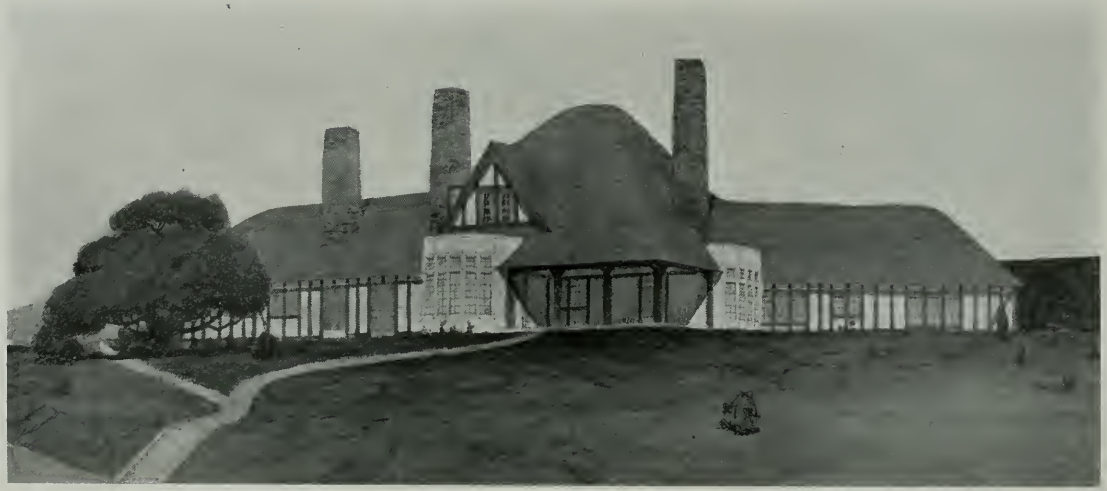


A HOUSE IN PIEDMONT, CALIFORNIA
WOOD AND SIMPSON, ARCHITECTS

Frontispiece
The Architect and Engineer
of California
For December, 1915

THE
Architect and Engineer
Of California

VOL. XLIII DECEMBER, 1915 No. 3

Residence Sub-Division—Its Relation to Urban Development and to Architecture†

By HORACE G. SIMPSON, Architect*

IN VIEW of the present keen interest in "City Planning" it seems opportune to consider the obstacles which frequently obstruct the progress of urban development and some agencies by which this development may be achieved. Even after the adoption of a wise and comprehensive city plan by a municipality the limited scope allowed the government in the matter of condemnation proceedings, and the cumbersome and expensive business of bond elections, subject the actual execution of the plan to frequent and often fatal delays. The bickerings of factional politics and reversals of policy by change of administration complicate the matter still further. Often, too, the selfish activities of speculators hamper the work.

Naturally this indirection in the working of municipal control leads us to seek agencies which offer more direct and speedy results. In the matter of completing the development of the residential sections of our cities we have such an agency in the privately developed residential sub-division. Once the general city plan and main arteries of communication are established by the public authority, these sub-divisions offer an effective means of completing the development and preparing the land for occupation.

In spite of the favorable opportunity thus offered, the results which have been obtained locally are in most cases so far short of the ultimate possibilities as to give rise to the suspicion of some radical defect in the program of development.

The get-rich-quick methods of some operators have often led to over-extension and excessive competition, and the result has been many tracts sparsely occupied and unable to support an adequate assessment for up-keep, etc. Many of these tracts have depended rather on speculative booms and skillful salesmanship than upon actual worth, and their quality has deteriorated rapidly, this hasty development and partial occupation causing a geographic expansion out of proportion to the population, which has burdened the cities with excessive charges for street maintenance, and has produced a general effect of civic untidiness and vacancy.

Leaving aside these deplorable examples of rapacity and unrestricted speculation as pertaining more to economics and political science than to architecture, let us consider those cases where a sincere effort has been made to approach ideal living conditions. Many of these tracts were laid out by

† Examples of recent English work are introduced to illustrate the points mentioned. The photographic plates are taken from "Model Houses in England," "The Hundred Best Houses," and "Garden City Houses."

*Of Wood & Simpson, Architects, San Francisco

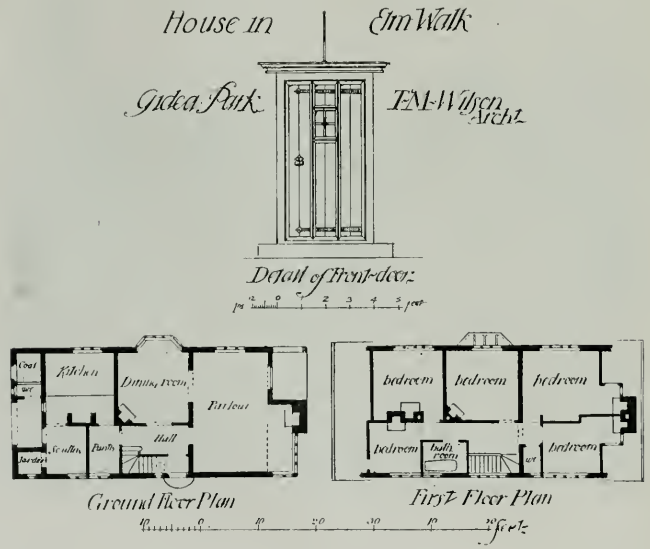
HOUSES IN GIDEA PARK, ROMFORD, ENG.
Showing advantage of grouping with heavy background of foliage

HOUSE AT MILL HILL, MIDDLESEX, ENG.
Stanley Hamp, Architect
Excellent example of finished setting

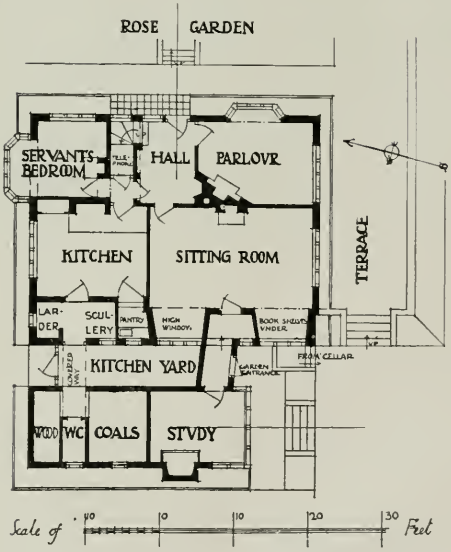
HOUSES AT PORT SUNLIGHT, ENG.

HOUSE IN HAMPSTEAD GARDEN SUBURB, ENG.
T. M. Wilson, Architect

HOUSE IN GIDEA PARK, ROMFORD, ENGLAND
T. M. Wilson, Architect



HOUSE AT HOOK HEATH, WOKING, ENG.
Horace Field, Architect



FIRST FLOOR PLAN, HOUSE AT HOOK HEATH, WOKING, ENG.

BIRD'S-EYE SKETCH, GIDEA PARK, ROMFORD, ENG.
Shows approximate number of houses built before tract was offered for sale

eminent landscape engineers who did their work well, and there seemed promise of notable achievement. This promise has largely failed of realization. We may trace this failure to the restricted scope offered to the landscape gardener, to lack of co-operation between the latter and the architects, and to poor design or lack of harmony in the architecture. Lest this indictment seem too sweeping, the writer hastens to say that the fault is not with the professions named, but with the method of their employment.

One chief objection to offering property with only the roads and utilities installed, is that it takes imagination on the part of the buyer to picture the beauty of the completed state. This is particularly the case with sites having few trees. Another objection is that many who would otherwise buy, fear

that the character of the district may deteriorate as it fills up, in spite of written restrictions designed to prevent this. Extensive observation of many local tracts in their present state gives good ground for this fear. We may trace this deterioration to the fact that while the site plans are often laid out by skilled landscape architects, their control is practically limited to the roads and sidewalk areas, and the major portion of the tract, viz: the building lots, passes into the control of the individual owners before any planting or building is done. The result is that the "tone" of the district is ruined by planting often ill-advised, and never with any general scheme or expert guidance. What happens in the case of the grounds and gardens is duplicated in the case of the houses; many owners with the best intentions and an evident desire to conform to the restrictions, erect residences so ill-mated or so badly grouped that the natural beauty of the site is lost. Sometimes a supervising architect is retained by the development company as a sort of aesthetic policeman, but his influence being rather restrictive than constructive, is largely deprived of its intended effect.

A disastrous result of the present lack of centralized control is a tendency to crowd a lot of houses together in one corner of the tract, while the balance of the land is left as barren as the Sahara. Frequently, also, speculative builders operate on the property to its detriment; they are able to circumvent the spirit of the restrictions, while technically observing them, and in reality they take a profit off the land company's investment.

The remedy for these conditions seems to lie in the direct control by the land company of a portion of the building and planting; preferably of all building done before the tract is offered for sale. The company would thereby be enabled to control the "tone" which is one of the chief assets, and to influence later individual work by restriction and example more effectively than can be done by written restrictions alone. This method would permit the selection of sites of special advantages, and the erection thereon of buildings fitted to those advantages; it would give scope for the work of the landscape gardener, who now is limited to planting borders and sidewalk areas; and it would bring about the co-operation between architect and landscape gardener which is the one infallible way to set and maintain a standard. The landscape gardener would thus be enabled to get scale and breadth into his work, to make it really adequate as a setting for the houses, and to obtain planting which should endure and improve from year to year, giving, finally, that indescribable charm of old towns which distinguishes England and the Atlantic states, and is conspicuous locally, by its absence.

This brings us to the consideration of trees, a point upon which local opinion is widely divergent. The climate in the immediate vicinity of San Francisco bay is unique and presents a special and very difficult problem to both the landscape gardener and the architect. The scant supply of sunshine at certain periods of the year renders deeply shaded avenues and huge enveloping masses of foliage inadvisable. For hygienic and for psychological reasons they are of obvious climatic unfitness. Equally to be avoided, however, is the hateful barrenness which marks many of our streets, and which some claim to be a climatic necessity. It must be remembered that at times we have sunshine of almost tropical intensity, rendering overhead shade desirable and protection from glare imperative. Realizing that landscape gardening is not his special business, the writer would yet venture the suggestion that if we were to use low-planting and slender trees on the southerly exposures of the grounds, reserving the denser growths for the north and west,

and tempering the sunlight on the roadways by the use of the low umbrella-shaped trees prevalent in Italy and about the Swiss lakes, we would be in a fair way to solve what might be termed our "climatic landscape problem," and to achieve an adequate and finished setting for our dwellings.

In recent years some of the owners of suburban property in England have adopted the scheme of planting the grounds and building houses at suitable intervals, say on every fifth lot, and then offering the tract in a comparatively completed state. This serves the two-fold purpose of enhancing values and of influencing the character of future development by example, more effectively than it can be done by precept or written restriction, and the result has been attended with a degree of success which the writer can affirm from personal observation. It is good business as well as good art, reducing the element of chance which exists with our present mode of development. When a land company leaves all building to the individuals, subject only to written restrictions, it surrenders that intangible psychological asset—"tone"—into the hands of those who may have no conception of its value, nor any interest in its preservation.

Somewhat more capital per acre would be required for starting development in the manner suggested, than where no building is done, but its employment would tend to accelerate the increase in land values, while the tangible artistic result of a completed and harmonious group would focus public attention upon the tract with far more certainty than the usual combination of road building and elocution. The failures and partial successes of the past show that we can not raise the standard save by example, and that the only way to set this example is to have the initial development of building under competent centralized control.

In a future issue Mr. Simpson will contribute a discussion of the small suburban house and its setting.

FOREIGN SKETCH
Kenneth MacDonald, Jr.

The Late Chandler I. Harrison and His Work

By JOHN BAKEWELL, Jr., Architect

Sketch of Garden, France

CHANDLER I. HARRISON, the promising young architect who died last August, soon after his return from Paris, was the winner of the Scholarship of the Pacific Coast League for 1913. He left for Paris to continue his study of architecture in 1914. He took the competitive examinations for entrance to the Escole des Beaux Arts and passed them with honor, being placed first in architecture above all competitors and receiving the highest total mark of all the foreigners taking the examinations. As the majority of foreigners taking these examinations are graduates of schools or architecture, this was a real honor.

At the time that the outbreak of war in Europe made it necessary to close the School of Fine Arts, Mr. Harrison was obliged to return to America with the other American students at that institution. About this time he became ill, and his condition grew more and more serious until his death in August, 1915.

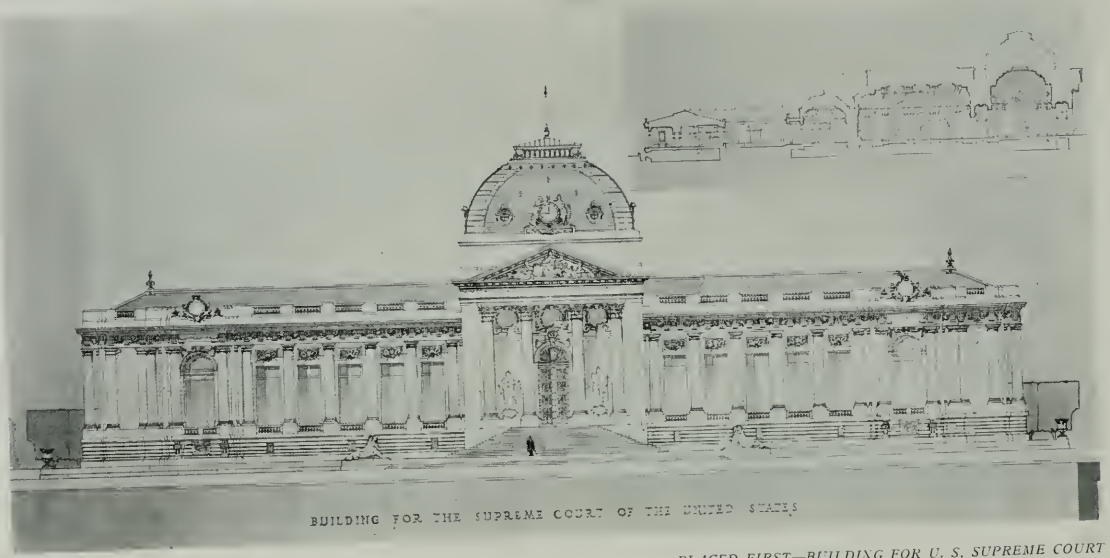
Harrison started his architectural studies in San Francisco offices, and in addition to his full day's work as draughtsman, took the course of the Beaux Arts Society as a student in the Atelier of Mr. Arthur Brown, Jr. It is difficult to realize what perseverance and courage are necessary for a young man to educate himself, under these circumstances, up to the point of excellence that Harrison attained.

The examples of his work that are shown here do not give a real idea of his true worth as an architect, as they cover only his work as a student. His work was always serious and showed a fine appreciation of the best in architecture. He had those rare but essential attributes of a creative architect, the will and ability to find an idea, and the skill and taste to express that idea in the best way.

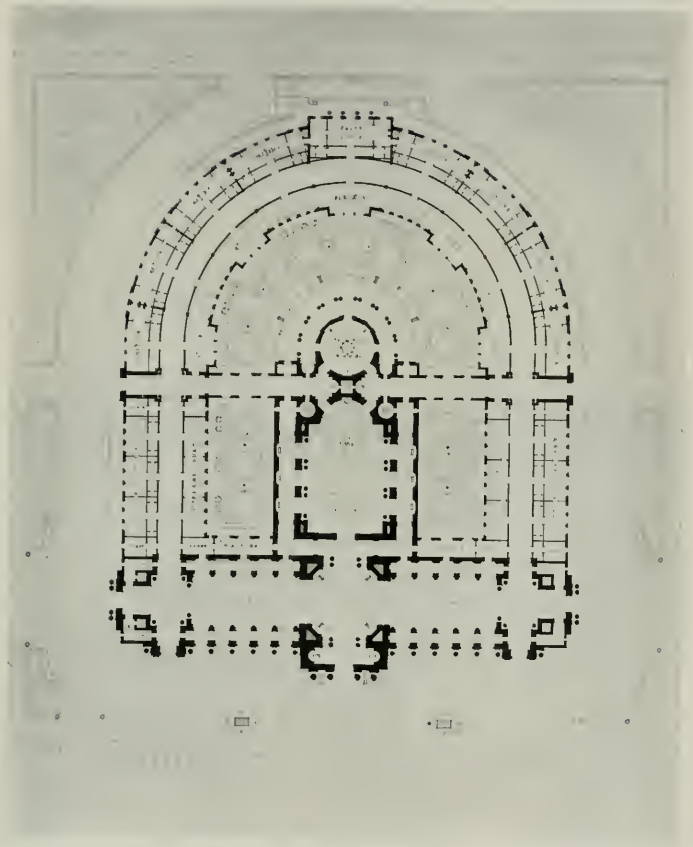
* * *

One of Mr. Harrison's closest friends was Edward L. Frick, who attended the Beaux Arts school in Paris at the same time that Har-

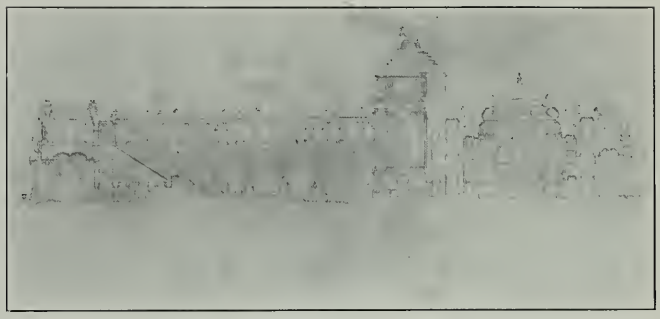
Le Petit Trianon, Versailles



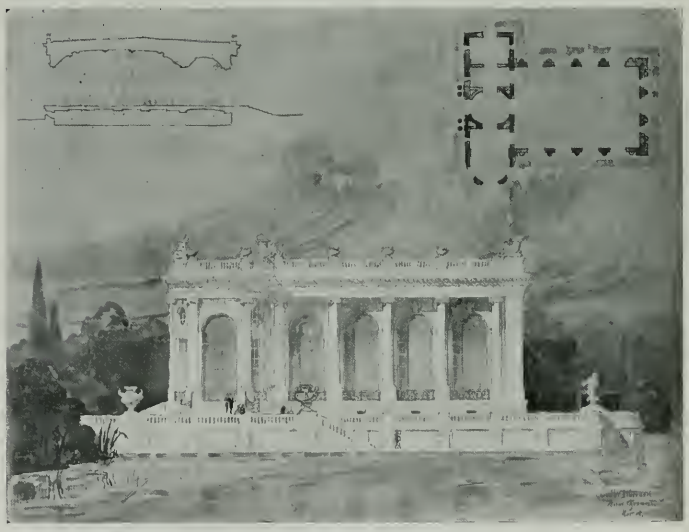
PLACED FIRST—BUILDING FOR U. S. SUPREME COURT
CHANDLER I. HARRISON



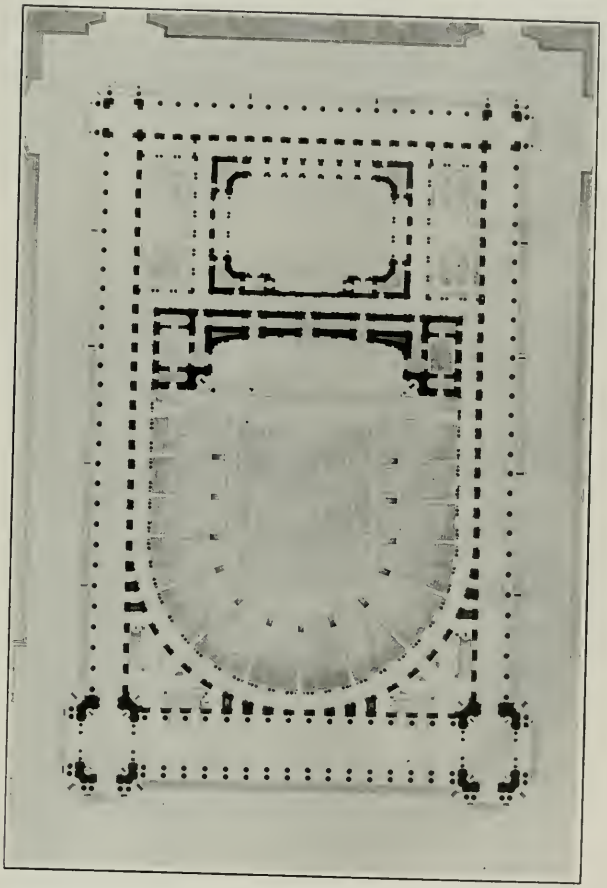
GROUND FLOOR PLAN, BUILDING FOR U. S. SUPREME COURT
CHANDLER I. HARRISON



SECTION, AN OPEN-AIR THEATER AND CONCERT HALL
Placed third in First Traveling Scholarship, A. L. P. C.



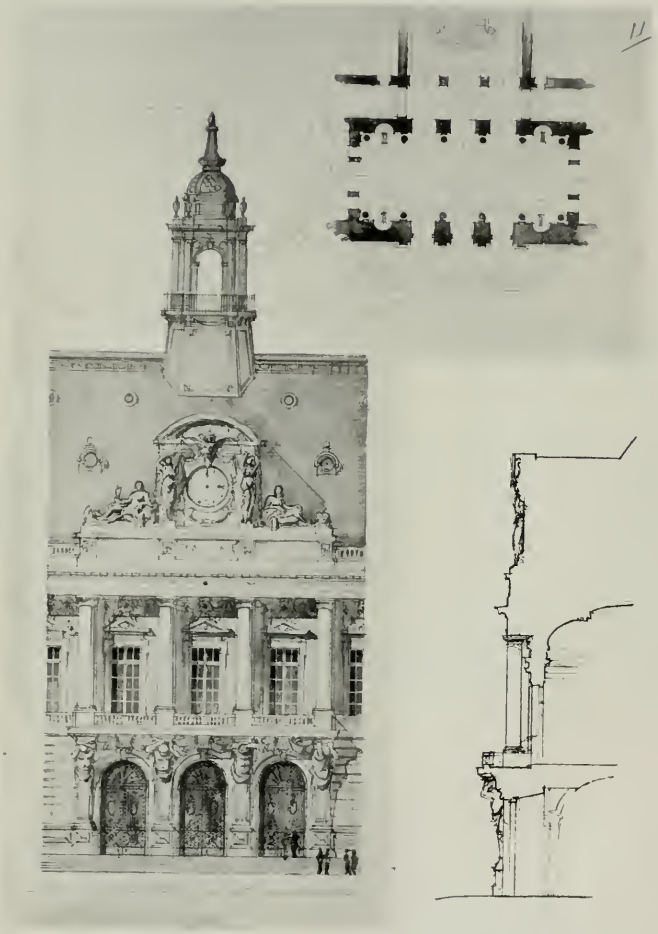
A DANCE PAVILION
Chandler I. Harrison



PLACED THIRD—GROUND FLOOR PLAN, AN OPEN-AIR THEATER AND CONCERT HALL
Chandler I. Harrison

ELEVATION, AN OPEN-AIR THEATER AND CONCERT HALL

CENTRAL MOTIF OF A RENDEZVOUS DE CHASEE
Chandler I. Harrison



CENTRAL MOTIF, A TOWN HALL
CHANDLER I. HARRISON

A DRIVEWAY THROUGH A BUILDING. CHANDLER I. HARRISON

Sketches, St. Cloud, France

rison was a student there. Referring to his friendship for him, Mr. Frick writes:

"One day in 1909 a group of young boys assembled to form an Atelier under Mr. Arthur Brown Jr. as patron, to follow the course of the Beaux Arts Society. It was there that I first had the good fortune of making the acquaintance of Chandler I. Harrison. His friendship proved to be sincere and honest.

"In the Atelier Harrison became a good friend of all the boys, and was always willing to give suggestions to any one who was in trouble solving his problem. His kind disposition and cheerful face was an inspiration to all. We admired him for his ability and courage to do his work. It makes us happy to think of the good times we enjoyed with Harrison while studying. His company was always welcome on any trip or party that the boys arranged.

"After he won the Travelling Scholarship of the Pacific Coast League in 1913 he journeyed to Paris, where, with Carl Warnecke, we lived together until the outbreak of the war.

"It was in Paris that I learned to value the true and kind friendship of Harrison. Never will I forget the six months of happiness we spent together. Harrison made many friends, and long will his memory remain with them."

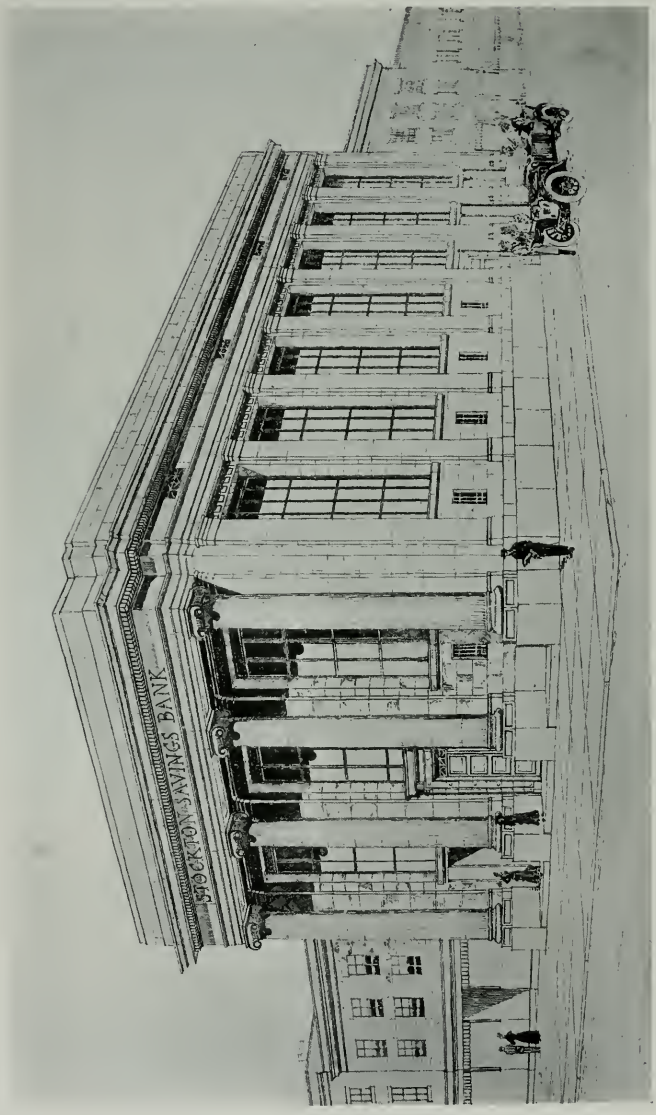
* * *

State Building for Civic Center

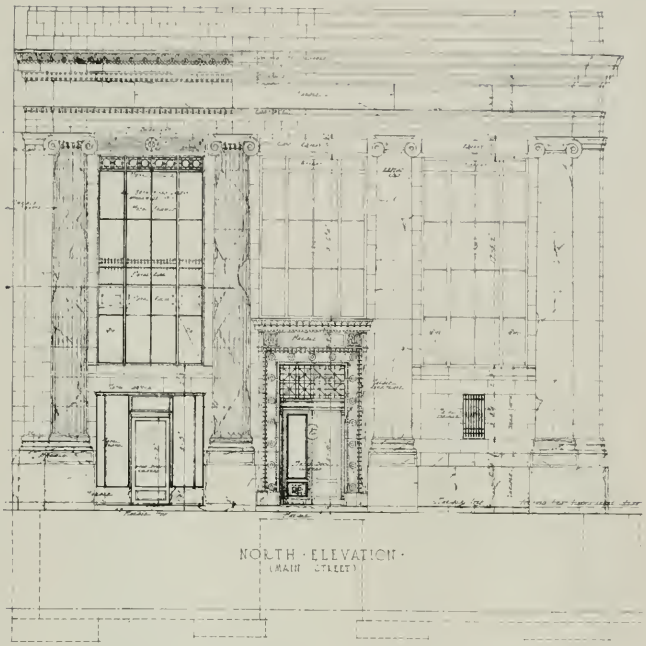
No step has been taken yet toward the construction of the California State building in the San Francisco Civic Center, for which the people of California voted a bond issue of $1,000,000. The delay is attributed to the inability of the State officials to sell the bonds, which bear interest at the rate of 4 per cent. Another effort is now being made to dispose of the bonds.

An architectural competition is to be held to secure plans for the building. Some months ago the State Board of Control expressed a willingness to take up $50,000 of the bonds, so as to provide money for holding the competition and doing preliminary work, on condition that San Francisco would bring about the purchase of the rest of the bonds. The Board of Supervisors was unable to arrange for the marketing of these State bonds, however.

It is intended that the design of the building shall harmonize with the City Hall and other municipal structures in the Civic Center, and the plans, when prepared, will be subject to the approval of the former Consulting Board.



STOCKTON SAVINGS BANK, STOCKTON, CALIFORNIA
CHARLES W. DICKEY, ARCHITECT



MAIN STREET ELEVATION, STOCKTON SAVINGS BANK
C. W. Dickey, Architect

The Stockton Savings Bank

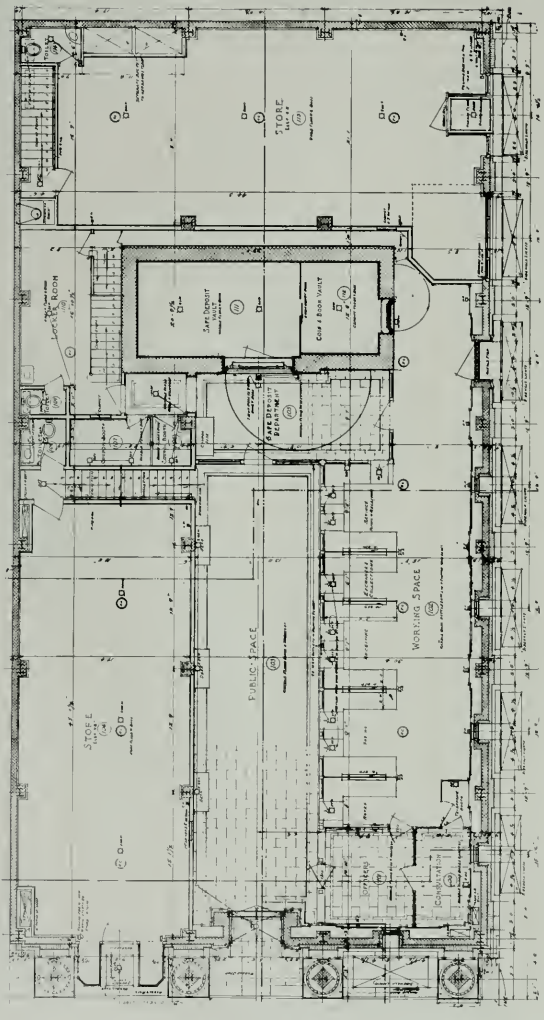
By CHARLES W. DICKEY, Architect

THIS bank will have the distinction of being the finest "individual" bank the busiest streets in the city, and surrounded by larger and higher building in Stockton, California. Located at the intersection of two of buildings, it depends upon the "scale" of its design to enable it to hold its own in dignity and importance.

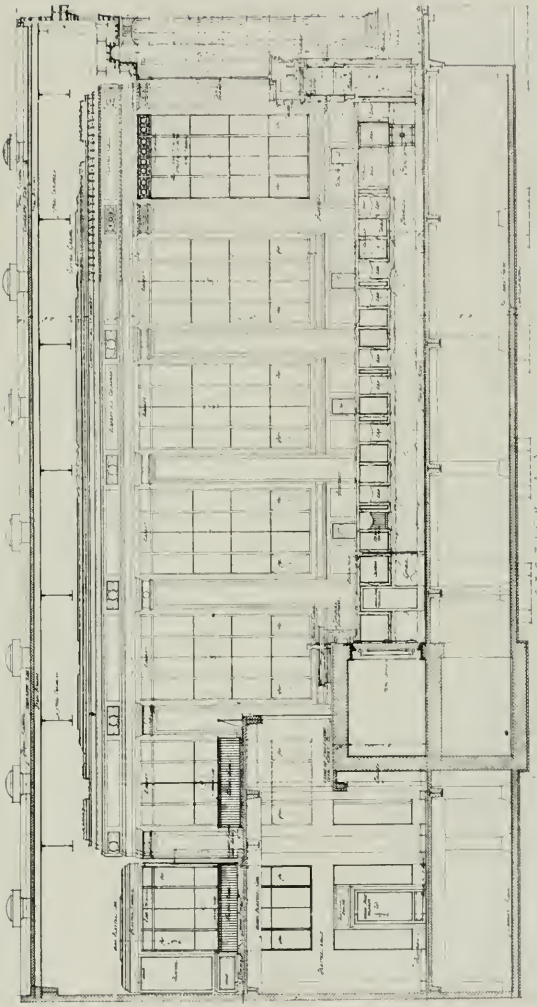
Although of a distinctly "bank" type of architecture, which is reminiscent of many banks throughout the country, the design possesses individuality, both from within and without, and the building will be a distinct addition to the architecture of Stockton and should exert a beneficial influence upon future work.

The lot is located on the southeast corner, being 50 feet on Main street by 100 feet on Sutter street. The building occupies the whole property and is treated as a unit although only the corner portion is to be used at present by the bank, the remaining space on both streets being rented for stores.

The bank will later require all the space and, to avoid unnecessary future changes and expense, the full ceiling is built at present, the stores occurring

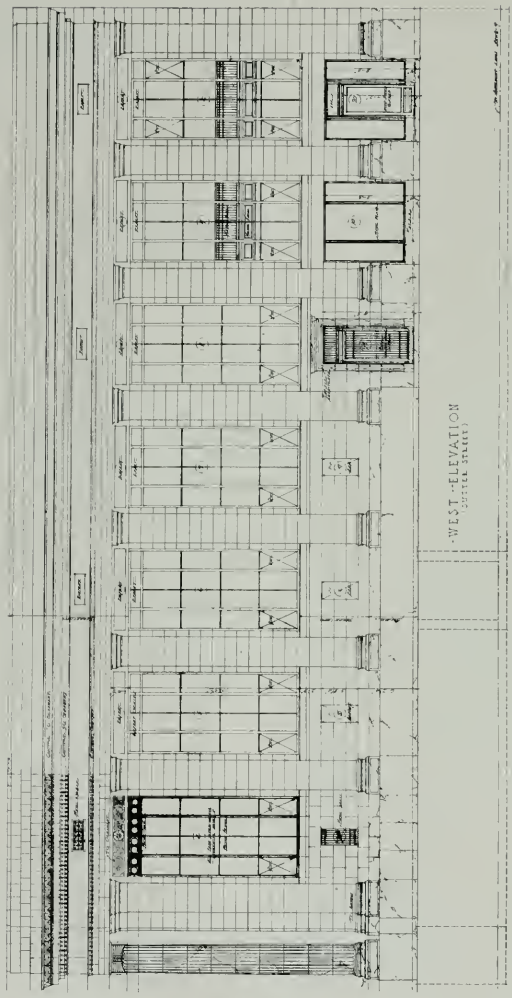


GROUND FLOOR PLAN, STOCKTON SAVINGS BANK
CHAS. W. DICKEY, ARCHITECT

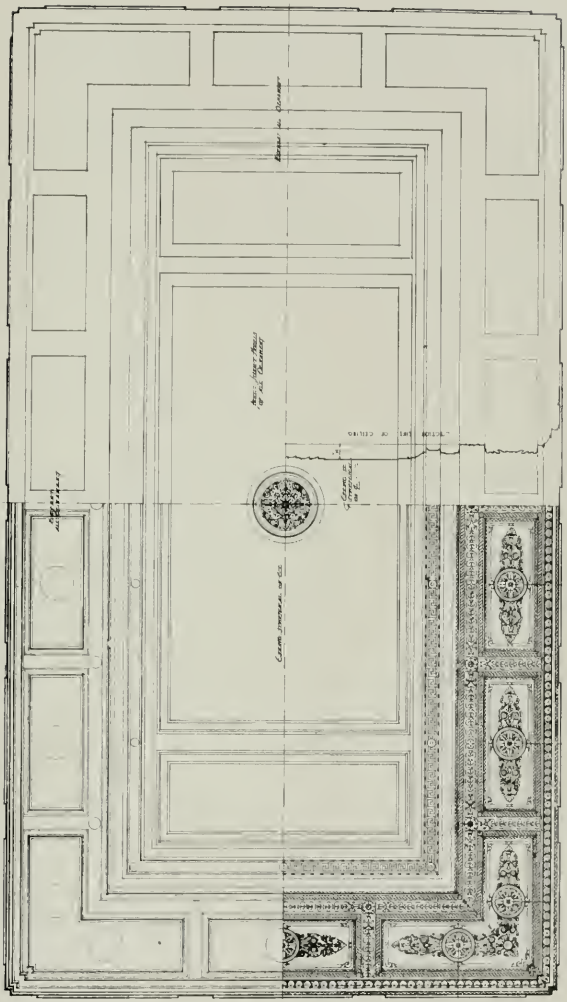


SECTION A-A

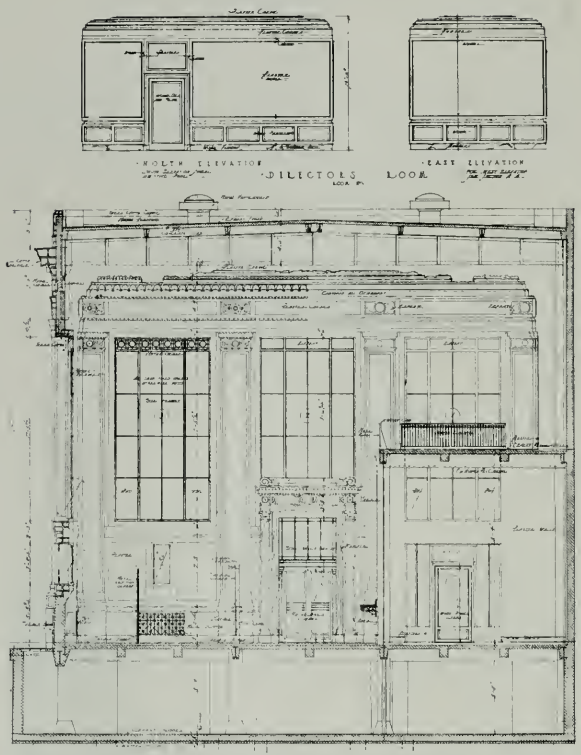
SECTION, STOCKTON SAVINGS BANK
CHAS. W. DICKEY, ARCHITECT



ELEVATION, STOCKTON SAVINGS BANK
CHAS. W. DICKEY, ARCHITECT



DETAIL OF CEILING, STOCKTON BANK
CHAS. W. DICKEY, ARCHITECT



ELEVATIONS, STOCKTON SAVINGS BANK
Chas. W. Dickey, Architect

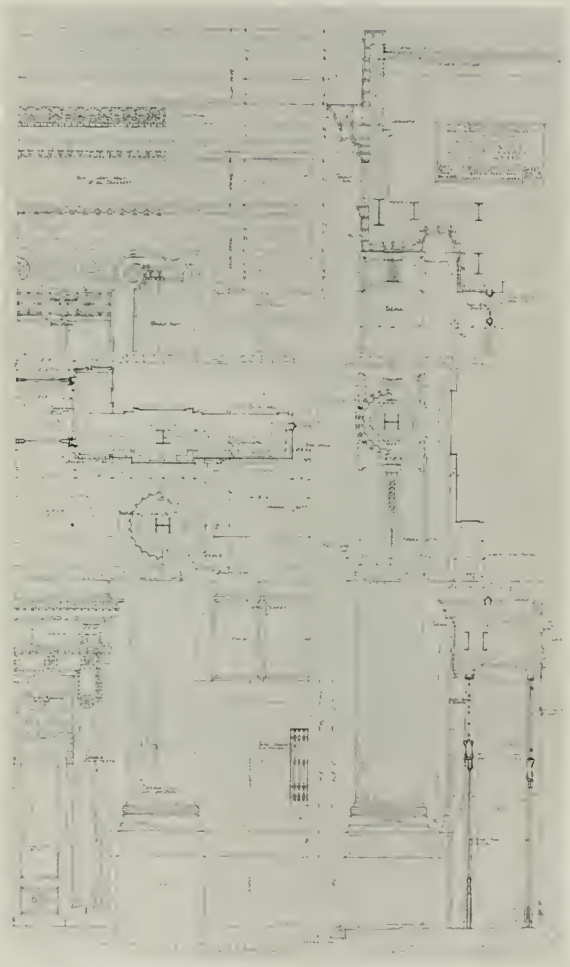
under a mezzanine floor. This arrangement of the interior secures an appearance of spaciousness and breadth.

The exterior is to be simple and dignified, with four Ionic columns standing free on the main front and seven bays separated by pilasters on the side street. The main entrance is placed in the center between the columns which throws the public space of the bank to the inside and the working space to the outside next to the windows.

The building is to be of class "A" fireproof construction and the exterior will be Tennessee marble combined with a warm grey terra cotta.

The bank counter and screen will be of Tavernelle marble and plate glass with small bronze wickets in the openings. Similar marble will be used for wainscoting and for the entrances.

The vaults and safe deposit department will be placed at the rear of the public space with a large circular vault door directly opposite the entrance. The officers' space will be near the front at the right of the entrance. The



EXTERIOR DETAILS, STOCKTON SAVINGS BANK
CHAS. W. DICKEY, ARCHITECT

directors' room will be located on the mezzanine floor and the ladies' room on a sub-mezzanine floor reached by marble stairs from the public space.

The banking room will be fully equipped with every modern convenience and will be lighted by indirect radiation from lamps concealed in a reflector back of the top rail of the counter screen.

The building is to be erected by P. J. Walker Co. of San Francisco, and bids are now being received by them for the various branches of the work.

* * *

The Sacramento Carnegie Library Competition

By LORING P. RIXFORD, Architect

THE writer's design for the new Carnegie Library in Sacramento was selected from fifty-five sets of drawings submitted in competition by architects from all parts of the state. [Brief reference to the competition was made in the November number of this magazine.]

The selection was made primarily on account of the simplicity of the design and its fitness for the purposes of the library. The rooms are well proportioned and especially well lighted, the stack is conveniently located and the space given to halls and stairs is the minimum, and especially arranged for convenience. The building is so arranged that it can be added to without in any way altering the original construction, and is ample for the present and future demands of the library for many years to come.

The design is in Florentine style, to be built of brick and terra cotta and presents two fine facades. That on I street, where is located the principal entrance, is quite monumental in character, while the facade of Ninth street is not only handsome in itself but is capable of being incorporated in the future as a portion of a larger facade which may some day form one side of Sacramento's civic center.

The plan of the building is arranged for the accommodation of about 250,000 volumes. On the ground floor is located, on one side of the public vestibule, the periodical room for eighty-two readers. On the other side is the children's department, arranged for seventy readers. One reaches the delivery room and reference room on the floor above by a fine oval stair, which is sufficiently separated from the rooms to insure quiet to the readers.

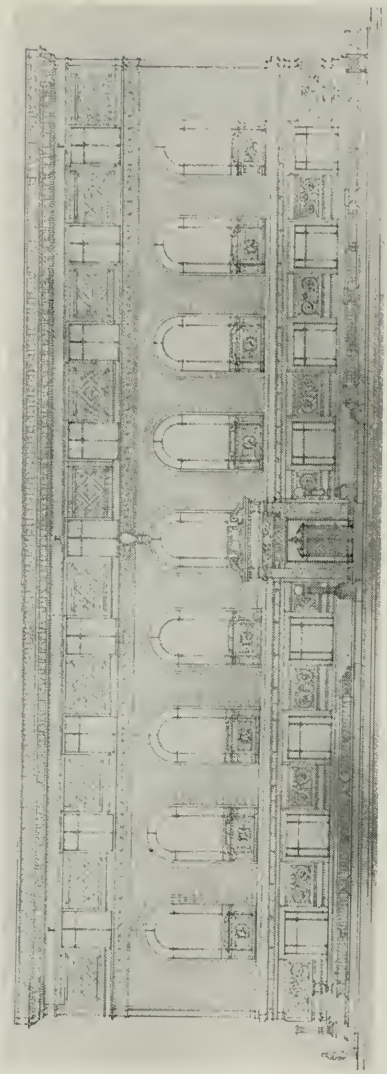
The delivery and reference rooms have nineteen-foot ceilings and large circular topped windows and grouped together as they are with the vestibule, separated only by low partitions, will present a fine open appearance.

In the delivery room there will be open shelves for the accommodation of 20,000 volumes, while the reference room will be arranged for 5,000 volumes and seventy readers. On this floor are offices for the librarian and cataloguers, and also space in the vestibule for the library catalogue cases.

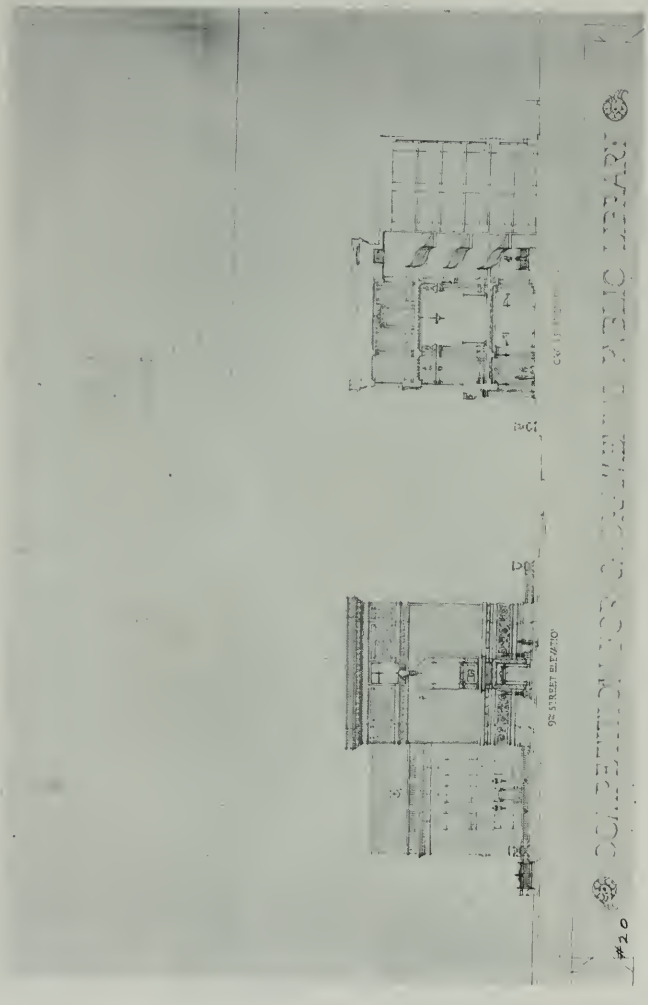
The third floor is devoted to the branch and school libraries, and special libraries for professional books.

In connection with the branch, there will be a receiving and delivery room on the first floor, convenient to the driveway in the rear of the building and within easy access of the stack by means of elevator or book lifts. The stack, which is accessible from all the important rooms of the building, is six tiers in height, with 30,000 volumes to the tier.

In constructing the building a spacious basement will be provided which may be used in the future for additional book storage, as well as boiler for heating and accommodations for janitor and help. The working drawings for the building are well under way and construction will be started without delay.



FRONT ELEVATION, CARNEGIE LIBRARY, SACRAMENTO
AWARDED FIRST PRIZE, LORING P. RIXFORD, ARCHITECT



ELEVATION AND SECTION, SACRAMENTO CARNEGIE LIBRARY
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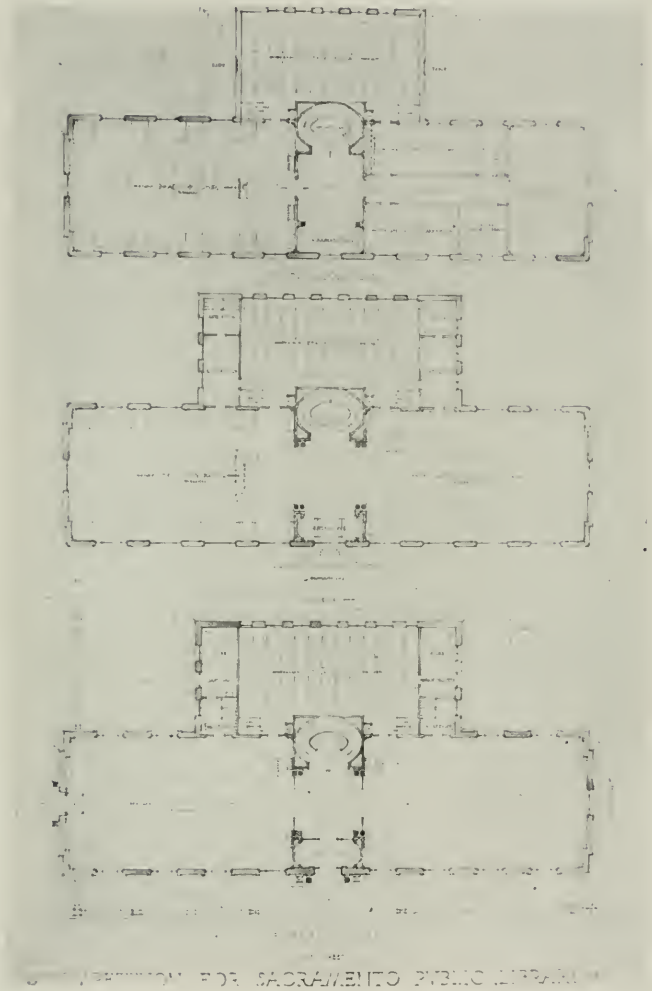

FLOOR PLAN, SACRAMENTO CARNEGIE LIBRARY
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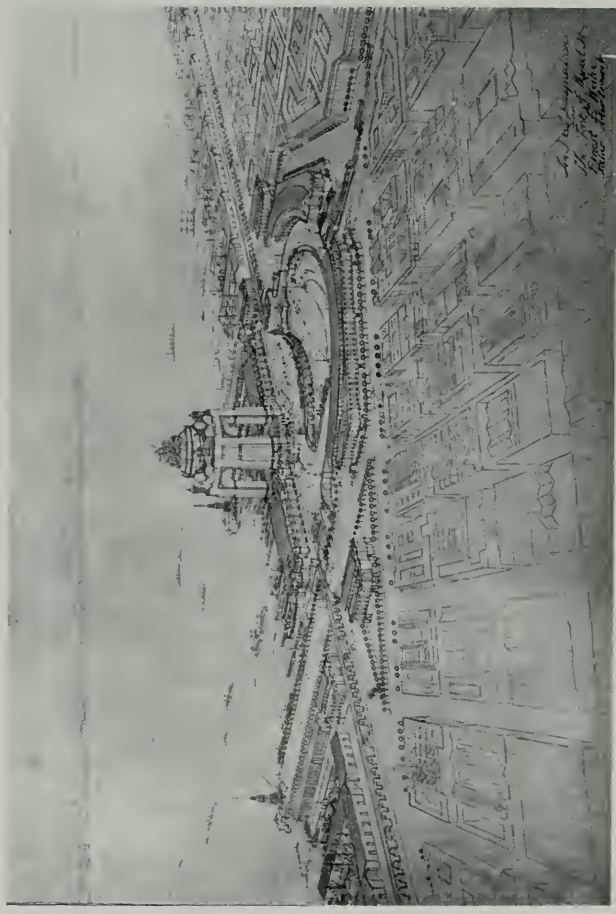


SUGGESTED TREATMENT FOR THE FOOT OF MARKET STREET, SAN FRANCISCO
SUBMITTED IN COMPETITION BY
ERNEST E. WEIHE

SECTION, TREATMENT FOR FOOT OF MARKET STREET
Ernest E. Weihe

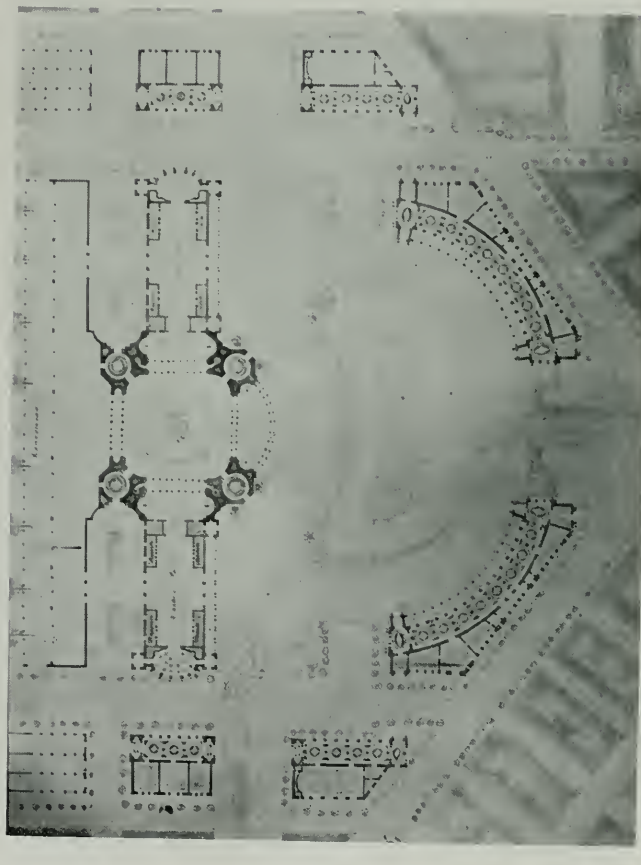
Competition for an Ideal Treatment for the Foot of Market Street, San Francisco

MR. ERNEST WEIHE, of the Atelier of Arthur Brown Jr., has been awarded the prize offered by the San Francisco Society of Architects in a competition for an "Ideal Treatment for the Foot of Market Street."

Mr. Weihe, the winner of this prize, is one of the group of young draughtsmen who have taken advantage of the work conducted on the Coast by the Beaux Arts Society, and who, by serious study and intense application, have raised the standard of draughtsmanship and design in San Francisco.

At the suggestion of Mr. O'Shaughnessy, City Engineer, and realizing the necessity for betterment of the traffic conditions at the foot of Market street, which is becoming more and more apparent as the city and its transbay neighbors grow, the society decided to hold a competition for an ideal treatment of the problem.

The object of this competition was primarily to arouse interest in this very interesting subject. It was felt that most of the proposed solutions, taking an extremely narrow point of view, tried by temporary and inadequate expedients to alleviate conditions by taking care of a portion of the traffic without considering either the ultimate needs or the esthetic side of the question. Such a scheme is that which has been lately proposed by the State Engineer's office, a scheme which enables pedestrians to cross the congested traffic in safety, but which does not consider those who arrive at the terminal in the street cars, and which does not take into consideration at all the real difficulty which will become more and more apparent as the shipping increases, that is, the conflict between the cross-street traffic of the waterfront and the street car and direct ferry street traffic.



PLAN FOR IDEAL TREATMENT FOR FOOT OF MARKET STREET, SAN FRANCISCO ERNEST E. WEIHE

Bearing these things in mind, a program was written which called for an ideal treatment of the problem. It assumed that the Ferry building was not built; that the only things that existed were the city streets, the ferry lines and the traffic conditions. By thus eliminating all things but these conditions which make up the traffic problem to be confronted, it was hoped that the students competing might be able to solve the problem thus simplified. To emphasize the ideal nature of the program the students were allowed to make new streets and to widen streets and change property lines at will.

The winning scheme separates the vehicle, car and pedestrian traffic into three distinct groups—the vehicle traffic on the street level, and the car and pedestrian traffic on an upper level. This upper level is treated as a large terrace with shop windows, etc., facing on it. The level is reached by stairs and ramps of easy incline, and serves to bring the larger part of the crowds to the upper deck of the boats in loading.

Traffic up and down the waterfront is undisturbed, and traffic from the Embarcadero out Market street or vice-versa is diverted to a large extent from the actual ferry center by means of diagonal streets. This leaves a comparatively clear area for automobile and carriage traffic to the Ferry itself.

The architectural keynote of the scheme is an enormous vestibule for the arriving and departing masses, with the waiting rooms, ticket office, etc, arranged in groups at the left and at the right. This vestibule is surmounted by an arch of great height and monumental character, forming in spirit a gateway to the city.

The area on the street level under the terrace is used for baggage, express and other rooms of such character.

The scheme also includes two large piers, which would be used for pleasure purposes, cafes, restaurants, etc., and for the landing of small boats. As the entire waterfront is becoming shut off to the public, these piers would be very desirable, and would be very impressive from the water side also, giving a clean architectural approach instead of one formed by a ragged line of commercial buildings.

While the ideal nature of this competition and of the winning scheme precludes any serious discussion of it as it stands as a practical solution of our Market street problem, still there are many things in it which must be used for any real solution.

Assuming that the present Ferry building remains, and that the present property lines be more closely adhered to, this scheme would still take care of waterfront traffic, street car and ferry traffic and pedestrian service, three things that no other suggested scheme (with the exception of that of Mr. Ernest Coxhead) has even proposed to properly take care of.

* * *

A Revolving House

One of the latest developments in freak construction is a suburban dwelling which is designed to revolve on a pivot. The house for which plans are now being prepared is designed to occupy a plot 100x120 feet and the idea is to so arrange that any side may be turned to the sunlight or shade as may be desired. The scheme is to build a circular concrete well and surround it with a terrace. A concrete platform resting on a huge pivot will revolve within the well something after the same principle as a locomotive turn-table. In fact, the house which is built of stucco and hollow tile will have a turn-table as a foundation.—Carpentry and Building.

HOUSE OF JUDGE A. H. SWEET, SAN DIEGO, CALIFORNIA
FRANK MEAD AND RICHARD S. REQUA, ARCHITECTS

PERGOLA ENCLOSED PROMENADE, HOUSE OF JUDGE A. H. SWEET
Frank Mead and Richard S. Requa, Architects

Unique Country House at San Diego, California

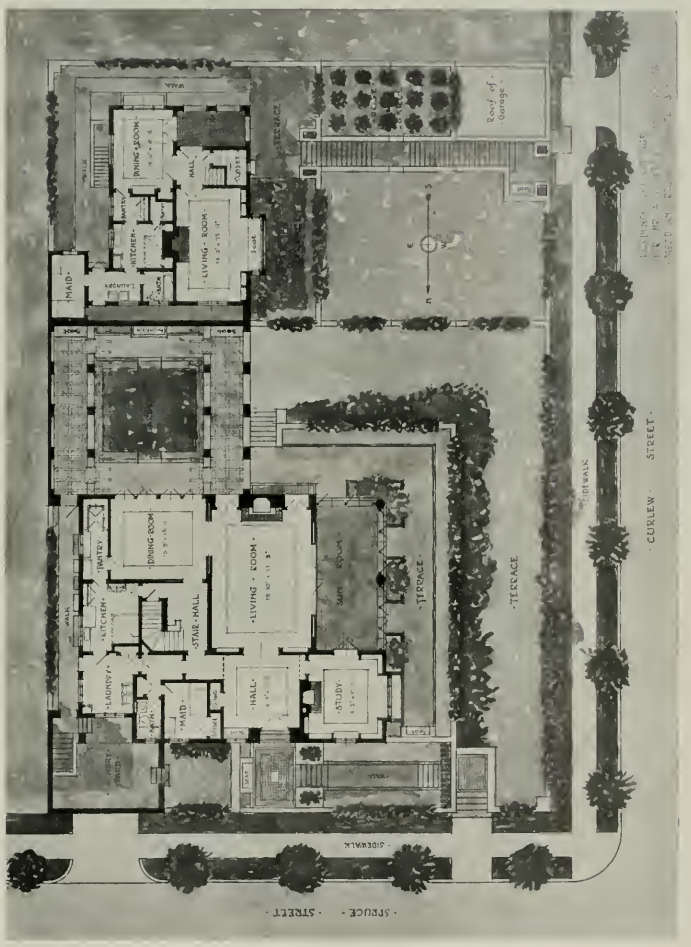
THE accompanying photographic plates of Judge A. H. Sweet's new home in San Diego, California, show a striking design along original lines that suggest some wonderful possibilities. With the straight lines and sharp angles relieved and enlivened by masses of foliage and bloom, the charming results can be easily imagined. What is prettier than the contrast between a pure snow white and a warm deep red. The house itself is of white cement, the roof is red and the flowers will be red. Numerous pergolas add to the scheme and give warmth and feeling to the general charm. At the ends of the pergola, inclosed promenades and oriental tiled seats invite the visitor to linger. The parapet caps the wall fountain and the garden seats are all finished in blue, white and yellow Moorish tiles.

The photographic pictures show some of the charming views one may obtain from the living room out through the pergolas. The quaint Moorish arched doorway with ponderous knockers and wooden bolt must not be overlooked, while the interesting little garden court is so intimate with the house it becomes truly an outdoor living room. Between the columns of the pergola, on page 76, a glimpse can be had of the Moorish wall fountain on the south garden wall. We are indebted to "The Western Architect" for the accompanying illustrations and the descriptive matter.

PERGOLAS, HOUSE OF JUDGE A. H. SWEET, SAN DIEGO
FRANK MEAD AND RICHARD S. REQUA, ARCHITECTS

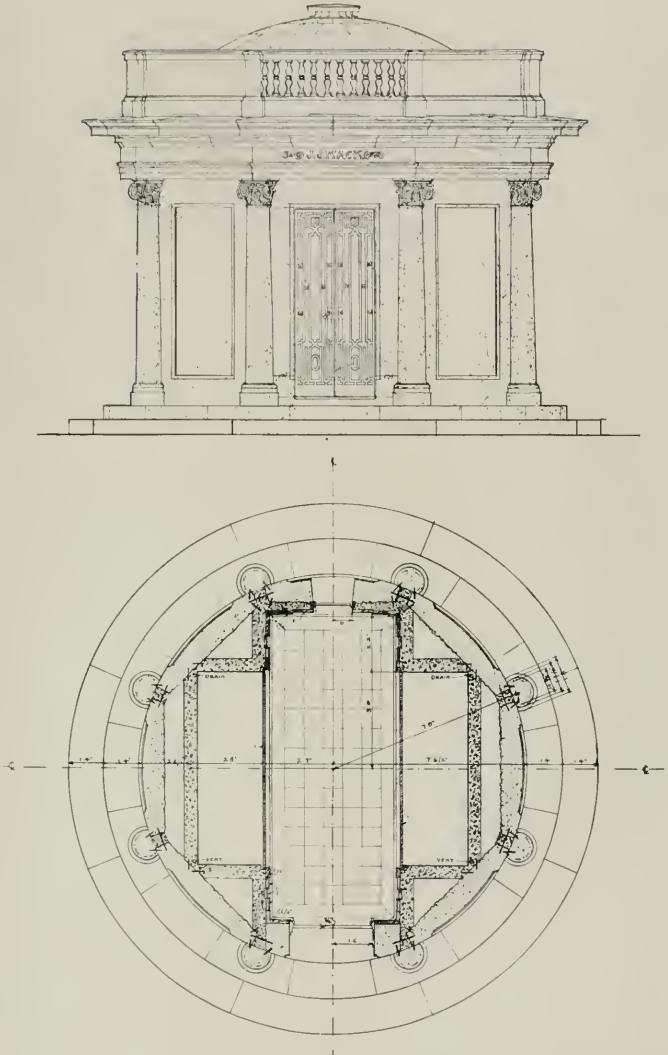
DOORWAY, HOUSE OF JUDGE A. H. SWEET, SAN DIEGO
FRANK MEAD AND RICHARD S. REQUA, ARCHITECTS

GARDEN COURT, HOUSE OF JUDGE A. H. SWEET, SAN DIEGO
FRANK MEAD AND RICHARD S. REQUA, ARCHITECTS



GROUND AND FLOOR PLAN, HOUSE OF JUDGE A. H. SWEET, SAN DIEGO
FRANK MEAD AND RICHARD S. REQUA, ARCHITECTS

Mausoleum, San Francisco
for Mr. J. J. Mack
Sidney B. Newsom and Noble Newsom,
Architects.
Doorway is facsimile of Entrance to Owner's Home
and
the design was worked out to accomplish
this end at the request of the
Owner.



ELEVATION AND FLOOR PLAN, MAUSOLEUM FOR MR. J. J. MACK
SIDNEY B. NEWSOM AND NOBLE NEWSOM, ARCHITECTS

The City Beautiful Defined

By H. C. WHITEHOUSE*

IN DEFINING the City Beautiful as it is beginning to be understood by the laymen today, I shall be able to touch only lightly upon the many practical, scientific and artistic details which must be worked together to accomplish this end. I shall include a few remarks on town planning, a subject which goes hand in hand with, and is closely related to that of city planning and beautification.

Within the past fifteen years there has been a surprising interest and consequent growth in the development of the "City Beautiful" in this country. The most gratifying part of this condition is the rapidly growing interest on the part of sound thinking men who realize and appreciate a skillfully planned and well executed general scheme of municipal improvement. Never in the country's history has the prospect of general and intelligent action toward artistic development been so marked as at the present day. Probably no one fact has had more to do with the recent interest in our country and foreign countries in city beautification, than congestion.

Congestion means overcrowding with all the attendant evils which arise from it. This great problem can be solved only by spreading the population out over a larger area.

As population spreads out, now, in the neighborhood of large cities, new quarters soon spring up in suburban districts, which are fully as congested as the old quarters in the city itself. It has been proved abroad that it is quite possible to avoid this state of affairs, provided sufficient attention is given to planning the outlying regions of a given city. It is fundamentally important, then, to pay as much attention to the social and economic side of the problem as to the esthetic.

The laws of the various cities for the past ten to fifteen years have been many times amended, but so far as they go, they are successful. But in spite of these apparently efficient laws, congestion is taking place, endangering the health of our people and the rising generation.

The architects' part in this development has been important. Through their organized clubs, societies, etc., they have been instrumental in bringing about a start in the beautification of many cities. This, taken in its broader sense, includes not only beautification, such as boulevards, plazas, parks, playgrounds, landscape architecture, heights and styles of buildings, both commercial and domestic, but it includes the successful working out of all sewer systems, water supply, electric wiring, etc., all of which must be planned to meet the requirements of generations to follow.

Until recently, it has been assumed that wide, straight streets and large spaces within blocks of houses are advantageous. Modern study of hygiene in Germany has shown, however, that while pure air is desirable in cities, the way to secure it is not by wide, straight streets, which furnish clouds of dust, not only injurious in itself, but accompanied by the germs of disease which are thus scattered broadcast among the inhabitants. To diminish this danger, which modern medical science regards as serious, streets should have curves and angles and the study of conditions which will give the minimum of wind and dust and the most air and sun. These two latter requirements are probably the most fundamental and remain uppermost in the minds of the architects in their studying and planning of the work.

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*Architect, 619 Hutton Building, Spokane. Abstract of address delivered recently before the Department of Architecture, Washington State College, Pullman, Washington.

Another problem is a social one. Under the usual system of planning with straight streets of uniform width and at equal distances apart, all lots are of the same size and the poor man must pay interest on the same amount of land and same width of street for his two-story house as the rich man for his six-story one. The consequence is to force the poor man to live in tenement houses, but under a more radical system of planning they could have their own small houses on shallow lots, on streets of proportionate width, which would be quieter, more free from dust, less expensive and more easily kept clean than wider ones.

It is now usual in some cities to restrict the height of city buildings in proportion to width of street on which they face. The requirements of a business street are, of course, different from those of a residence street; it needs wide sidewalks so that an attractive window display may not cause obstruction to the traffic, and rear passageways so that delivery and shipments of freight may not block the street in front.

Street landings to factories may have space for seats, where poor people who have no watches may rest until the factory doors open.

One of the gravest faults of American cities is to be found in the uniformity of the treatment of blocks. The rectangular block system offers little opportunity for variety. The fault is due largely, not so much to the architect as to the speculative builder, who runs up block after block of houses all absolute duplicates. The public is itself to blame for this condition, through its failure to have suitable regulations adopted. Aside from the esthetic effect to be obtained, one of the most difficult of the problems is to provide light and air for the rear rooms. To obtain a suitable circulation of air is more troublesome than to secure adequate light. To secure the best conditions possible, architects today are studying these great problems the world over and it is resulting in civic regulations of how blocks are to be built up, resulting in the admission of plenty of sunshine and air to all living rooms.

This one feature alone presents many difficult problems to solve, both artistically and practically, and many of the larger cities have adopted the plan of having a board, composed of sound-thinking business men, architects and engineers, with authority to pass on the designs of all buildings before being erected.

Where there is no regulation of the heights of buildings, not only the utmost architectural disorder ensues and a jungle of buildings springs up, but most unjust commercial conditions arise and most serious of all is the congestion of traffic, as in the case of the city of New York. To cite a single instance, the Woolworth building, to be sure a masterpiece of American architecture, engineering and genius, rising to a height of 750 feet above the sidewalk and containing 56 stories. This building has a normal capacity of 10,000 people, who arrive and depart from the building say in a couple of hours' time, at morning, noon and at night, and conservatively speaking, as many more arrive and depart from the building during the business hours of the day. This immense army of people passing and repassing along the already crowded streets adjacent to the building causes an unjust burden on the city because of the increased watch on traffic, endangering life, and most important of all, shutting out God's free air and sunshine, two elements most essential to life and health.

Parks and playgrounds are probably the greatest institution on which cities can spend their money. There is no greater benefit to the health and enjoyment of people than a park. This has always been universally recognized in the past as well as at the present time by all cities. They have been the

salvation of thousands of souls in many of the larger eastern cities, especially where the summer heat has been death dealing.

To say that our cities have been adequately equipped with park systems, would not be true. The older cities throughout the world, except those properly planned, have generally had their parks few in number and large in area. During the later years it has become universally recognized that a greater number of parks, smaller in area and well distributed throughout the city, are of more benefit, and are enjoyed by more people. This fact is true, because where parks are more evenly distributed, it brings them in closer proximity to the people of all classes, more especially the poorer class, to whom car fare is an item of consideration.

It is needless to go into details or explain what enjoyment and benefit can be derived by a visit to a park, with its cooling fountains, green lawns, cool shade trees, its beautiful gardening of shrubs and flowers and most of all, for the youngsters, the animals and birds.

For the health and sturdiness of our rising generations in the city, probably no one item is more vitally important than that of playgrounds. Children, both boys and girls, must have exercise in every conceivable form. It is their life and their pleasure and rob a child of this, he or she soon becomes puny and delicate, and when caused by these most unnatural conditions, it is a blot on our civilization and on our country.

There are many details in city beautification and planning, such as relief spots, small fountains with a bit of grass and a few seats, statues of heroes and public benefactors, well distributed branch libraries and places of historical interest and enjoyment. These latter, of course, are of great educational value.

The value of relief spots can not be over-estimated. How enjoyable, after a few hours shopping or sight-seeing on a hot day, it is to be able to find a bit of green sward and possibly a cooling fountain and to sit, if only for a few minutes, to refresh oneself.

These places are becoming numerous in many of the larger cities and are easily tucked into triangular pieces of land left by the intersection of some diagonal crossing. There are the places which one delights in working up. They form the finishing touches to a well beautified city.

Much can be said with reference to the scientific side of the work, such as sewers, water supply, light and telephone wires. In nearly all of our well regulated cities, wires and poles no longer mar our streets, wiring is kept underground and run in conduits of tile pipe and other forms of covering. Street lighting is a very important factor in a well planned city and being well lighted, especially in the outlying districts, is an important factor in the protection of our citizens.

The scientific, as well as the artistic making of a city beautiful, is not a problem quickly solved. A most difficult feature is the proper provision in all details for the future in years to come.

Town planning has become, in some of the foreign countries, a more worked-over subject than that of city beautification. In a certain village in England a large manufacturing plant is located. They have a well-planned town, and it may be of interest to know how this town came into existence. This manufacturing plant was originally located in one of the large, congested cities of England. Upon a thorough investigation by the managers of the institution it was found that its employees were housed in dwellings which were conducive to poor social conditions, such as discord among the inhabitants, immorality, improper light and air, and many fatal diseases. These, in turn, produced inefficient workmen. The situation was carefully studied in

every detail, and the result was that the manufacturing company decided to move its plant from the large city and secured a tract of land in a thinly settled district of England. The next step was to plan a model village with perfect sanitation, fresh air and sunshine. Cottages were planned in groups and detached, each with its garden in the front and rear, good plumbing conditions, and everything that would go to make up perfect housing in an economical way. The company rented the houses at a very reasonable figure and went further by offering prizes to their employees living in these homes for the best-kept grounds, stimulating an interest in the beautification of the little village and, at the same time, providing a healthy diversion for its people. After a few years of existence, statistics showed a remarkable decrease in the percentage of deaths from disease, a happier and more contented people, and far better and more efficient workmen for their factory.

Proper recreation for working people is becoming more and more recognized by manufacturers throughout the civilized world. Not long ago I heard of a large manufacturer looking for a possible location for his manufacturing plant. He visited several western cities and in one city, which looked particularly good for the carrying on of his business, he asked—"One of the most important things I desire to know is, where are your parks and playgrounds?" The city fathers had to admit that the city possessed none. He said, "My people must have fresh air, sunshine and recreation for their good and for mine. Therefore, I cannot consider your city as a location," and he made his departure.

It would indeed be an interesting topic to discuss the progress that American cities are making toward the city beautiful, and its attendant difficulties. It is a colossal task to bring about a city beautiful plan in a city long established, such as Chicago, New York, Pittsburg, Philadelphia, Cleveland, San Francisco, and many other American cities where the problem is being tackled. It is especially difficult where a city has been laid out with no regard to a correct plan, or its future growth. The natural supposition is that all of the smaller and younger cities of our country could take up this great work and lay the foundations for great and beautiful cities. This seems to have proved unsuccessful in the general run of cases. Cities that have large populations and are capable of raising millions, tackle the proposition and make their start.

It is unfortunate that this condition exists, but I believe, in view of the fact that so many of our larger cities have made their start and are progressing nicely, that it will not be many years before the smaller and younger, growing cities will take up the work in earnest.

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A Well-Built House

It is hard to impress people who laud their possessions on all occasions. Mrs. Allen was enthusiastically enumerating the many advantages of hollow tile construction:

"The air-spaces in our walls afford insulation against heat in summer and cold in winter. And such walls afford ventilation and insure a more healthful house."

Her listener nodded approval.

"Our frame house must be quite as well built," she averred. "Every night we lock the cat in the cellar and in the morning we have to let her out of the attic."

The Toy Theater—A Suggestion for Pacific Coast Architects

By PETER NEWTON

"We know just where the fairies live and we can show you true;
If you'll be patient we will give the fairy lore to you.
We know just what the fairies do, we've all their charms and arts,
For fairy joys and frolics too are hid in children's hearts."

THE theater is one of the most potent factors of our complex civilization. And yet, strange to say, until recently we have quite overlooked its most important use, its greatest opportunity for pleasure and benefit—namely, in the amusement and education of children. If we instill in the boys and girls of today a love of the beautiful and an active appreciation of that which is wholesome and pure, we may be sure that the theater of the future will reflect those ideals. Here and there we have dramatized a fairy tale like "Cinderella" or "The Sleeping Beauty"; or we have transformed into juvenile drama or picturesque tableaux some familiar Bible story or famous historical event, but these productions have been few and far between. A real theater, devoted solely to the children's interests, is still to come.

And it is coming—soon! For a Toy Theater is shortly to appear in New York.

The playhouse is to be built in West Forty-seventh street, just off Fifth avenue, and it will have a seating capacity of five hundred. As the home of dramatic entertainment for children, the Toy Theater has been designed with their ideals and aspirations and their point of view in mind. The very name suggests the mysterious and the make-believe, which all little people love. And the architects, F. Burrall Hoffman, Jr., and Harry Creighton Ingalls, have been particularly happy in their handling of the design. They seem to have caught and expressed in every detail of the decoration, the spirit of a children's theater where magical stories will come to life.

The street front, suggesting some Old World building in a mediaeval town, hints at the wonders to be found within. What child—or what grown-up, for that matter—could resist the inclination to enter the low portal and explore the realms of fairyland that must surely lie beyond!

The auditorium is worked out in simple Gothic columns and beams, with twelve panels depicting, in processional form, the history of magic and fairy lore in general. On one side of the entrance there will be "The Fairy Queen," and on the other "The Pied Piper of Hamelin," while the curtain will show a street fair in an ancient town, with a conjuror in his booth entertaining a crowd of gaping yokels.

On the second floor will be found a tea room for the serving of refreshments, and with drawing rooms for patrons. These rooms, together with the playground on the roof, have been designed by Helen Speer, who has treated them in a manner wholly delightful and with a colorful conception of design which gives them a typically childlike air.

The third floor will be used as the administration offices, and up in the peak of the roof will be the study of the managing director—a high-vaulted, tapestried chamber, in grotesque Gothic of the thirteenth century. Here on a cold winter's night, as the clock strikes twelve, one can well imagine many an elfin shape and fairy shadow scurrying from the books in which they dwell, to sit in a wide circle before the hearth and discuss with the director a forthcoming fairy play for their friends, the children. Or one can picture them

scrambling up the narrow stair with him to the overhanging balcony, looking down into the shadowy corners of the study where old Stuffed Owl and Black Wooden Cat hold midnight conferences, peering into the workshop where the magical apparatus is thought out and constructed, or looking through the leaded panes at the playground bathed in moonlight, with winding path and peasant's cot and castle tall among the trees.

The theater proper will run parallel with the street at the rear of the property, which is eighty by one hundred feet. The lobby will run from the auditorium to the street and have a frontage of twenty feet. Along the front of the property and in keeping with the Toy Theater front, there will be three little five-story buildings, all devoted to the interests of children.

Here will be a toy shop, a book store, a photographic studio for children, a salon for dancing classes, a hall with a stage for amateur dramatic societies, and various other juvenile features. In fact, the whole property will suggest a little street in "Hamelin Town in Brunswick, by famous Hanover City"—a veritable fairyland! Beside the doorways will be funny little Noah's Ark trees on flat stands, and on each side of the gateway to one of the shops a wonderful red, white and black wooden soldier will be on guard—because, of course, anyone who does not believe in hobgoblins, fairies and other tiny folk cannot enter here.

Fairy lore from the mystic sagas of the Norsemen in the time of the Druids, the stories of the Arabian Nights and the fairy tales of Mediaeval Europe, not to mention the classic myths of ancient Greece, have all been drawn upon in the treatment of this children's wonderland. It will indeed be a magic spot in the great busy city—a place where all that is beautiful in childish song and verse will be visible, and where children of all ages may, like Alice down the rabbit hole, wander to their hearts' content among the things they love to read about and find them really, truly, true!

In this little Toy Theater there will be presented for the children playlets in which magic craft will work out the marvelous happenings of the fairy tales, folk lore and legends. Motion pictures of suitable sort will also be shown, so that youngsters may see those which, from an educational standpoint, will be pleasing and instructive, without having to sit through those which they should not see. There will also be plays suitable for young people who are not quite grown up, such as the adventures of Ivanhoe, William Tell, Columbus and other historical characters, as well as playlets of illusion like "The Pipes o'Pan," "Captain Kid," "Napoleon in Egypt" and "The Juggler of Touraine."

One can imagine how eagerly the youthful audience will watch these little plays and tableaux of fact and fiction, and with what breathless suspense and childish glee they will behold the marvels of magicians, witches, elves and other wonder-folk. How happy they will be to see fairy tales come true before their eyes, to behold giants in seven-league boots striding across the landscape, tiny dwarfs hiding their treasures in some mountain cave, gallant knights rescuing fair damsels in distress, and fairy godmothers appearing at just the crucial moment with gifts of magic for some fortunate protege! And how much more interesting and real the history books and geographies will seem, when upon the stage appear the familiar personages of the past and the picturesque people and costumes of foreign lands!

The Toy Theater will fill a definite place in the movement for the education of children along broader and more interesting lines, and its influence for good should be very great. With this little playhouse in New York, as a center where writers, painters, musicians, conjurors and actors may all work together to produce a perfect children's drama, the idea may very soon become wide-

spread. The "movies" will contribute their share toward the work of reproducing for general distribution the productions of the Toy Theater.

The corner-stone of the building, which is soon to be laid, will bear an inscription dedicating it to the children of all countries and climes. For it is hoped that this little theater will prove to be the inspiration of many more Toy Theaters where the children of all peoples may gather to enjoy the tales which have come to them down through the ages—theaters where everything sweet and lovely may be instilled in their minds, that they may be the better equipped, when they too have become "grown-ups," to keep their ideals unsullied by the grosser facts of life.—The Craftsman.

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Hardwood Floors in Fireproof Buildings

In discussing floor surfaces in fireproof buildings in a paper read before the American Society of Mechanical Engineers, Sanford E. Thompson pointed out the kinds of hardwood floors best adapted for the purpose and also the method of laying them. We present the following extracts as likely to prove of interest:

Floors of maple, birch, beech, oak, or long leafed Southern pine are used most largely for offices, class rooms, or lecture rooms, and in many of the older colleges for laboratories and halls. A wood surface, however, is not usually considered entirely satisfactory either in general appearance or in wearing qualities. If one passes from a corridor with a granolithic, terrazzo, or tile floor, into a room or auditorium having a wood floor, there is a marked effect of inferiority and cheapness.

There is just as much danger of poor materials and workmanship with wood as with other kinds of floors. Unless the greatest care is taken in selection of materials and workmanship, they are liable to shrink or swell and sometimes to squeak under foot. If at all hollow underneath, they are more noisy than a concrete surface.

For corridors, wood is being largely superseded by granolithic, terrazzo, or tile. For laboratories other materials are being substituted for wood in most of the newer structures, although wood is occasionally preferred, especially for physical laboratories and for laboratories where men stand for long periods. The linoleum on concrete will overcome practically all the objections that are made to wood floors, with a cost substantially the same.

There are various methods of laying hardwood floors. For class rooms a single thickness of maple or birch nailed to sleepers with cinder concrete between should be satisfactory. Another type of construction is to use patented metal screeds embedded in the base concrete, and nail the floor boards to splines in the screeds. For rooms subjected to heavy traffic, 2-inch or 2½-inch plank may be placed underneath the hardwood floor.

Of all the different materials, oak is the most expensive and the finest in appearance at the beginning, but under heavy traffic is more liable to splinter than the finer grained woods. Georgia pine, if of best quality, makes a durable floor, and is preferable to the finer grained woods in wet places, as it does not swell and warp so badly. It is less durable, however, and therefore not recommended for the greatest permanence in rooms such as class and lecture rooms. Maple, birch and beech all make good floor material. These are usually laid in strips ⅞ inch thick by 2¼ inches wide.

SURF BEACH, ALAMEDA, CALIFORNIA
Edwin J. Symmes, Architect

Some Architectural Features of Alameda's New Amusement Park

By FREDERICK JENNINGS

THE theory of design in amusement architecture has been given considerable thought in this and other countries during the past few years. Many designers of amusement work, however, have a tendency to lean toward the grotesque, without regard to environment. Amusement architecture may be applied to two widely different problems, namely: the concession street of an exposition, and the buildings of an amusement park.

The grotesque and fanciful have their place on a concession street of an exposition where a contrast is desired and welcomed, as a relief from the serious and generally classic architecture of the exhibit palaces,—a place where one may go to laugh when the mind is weary of learning. The concession street of an exposition should satisfy the wildest flights of fancy in design and color. Its buildings need not be architectural in either form or detail, differing in this from the palaces which should be the last word in architectural design.

At an amusement park, where there is no contrast, the impression to be left upon the mind of the visitor is one of gaiety, surely, but is it not possible for the architect to be gay and festive without doing the unlovely?

The architecture of Surf Beach, Alameda, is Spanish Renaissance with a suggestion of the art of Islamism which so admirably blends itself into the former style. This combination is well adaptable to the use of color and varied forms; is expressive of gaiety, yet refined. Harmony and unity will thus be attained throughout all the buildings of the park, including the concessions.

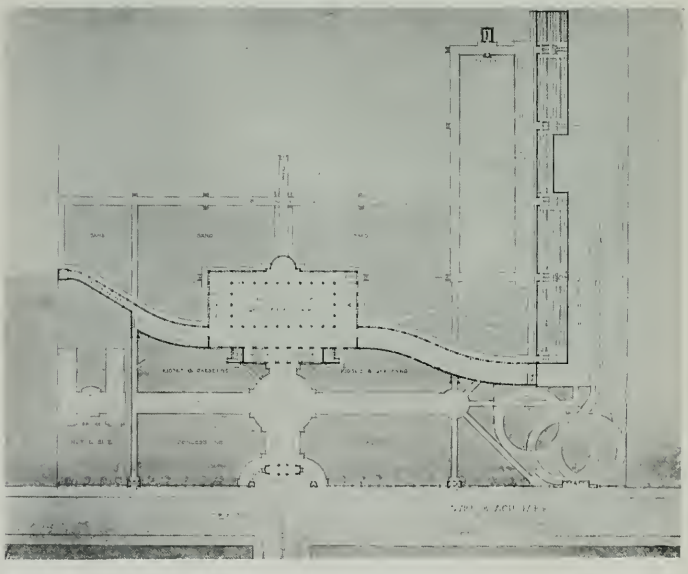
The park is planned for economy of operation and for simplicity of entrance and exit. The main entrances and exits are located near the center of the Park on Central avenue, and will be incorporated in the new Surf Beach station on the Southern Pacific electric line from San Francisco. Overflow gates will open on Central avenue at the eastern and western extremities.

The entrance is marked by a tower, one hundred feet in height located on the center line of Webster street, and looks directly into Oakland across the

ENTRANCE TOWER FOR SURF BEACH, ALAMEDA
EDWIN J. SYMMES, ARCHITECT

SURF BEACH STATION, ALAMEDA, CALIFORNIA
EDWIN J. SYMMES, ARCHITECT

PAVILION, SURF BEACH, ALAMEDA, CALIFORNIA
Edwin J. Symmes, Architect



SURF BEACH PARK, ALAMEDA
Edwin J. Symmes, Architect

Webster street bridge. This tower forms the dominating note from the exterior. A decorative plaster wall, eight feet high, will enclose the grounds on the north, and concession buildings backing against this will be finished in an appropriate manner.

On the beach, as you enter the park through the tower, will be the pavilion, flanked on each side along the line of the beach with sheltered promenades and spaces for concessions, one story high on the land side and two stories high on the beach. The pavilion will have a maple spring dance floor sixty feet wide by one hundred and twenty feet long, a ladies' parlor, rest rooms for men and women, spacious lobbies and wide stairways to the beach and cafe below.

The dressing rooms for bathers, three tiers in height, will be located along the west line to form a windbreak for the sand beach and swimming tank. The rooms will be four feet square and provided with seats, clothes hooks, mirrors, etc., and will be in close proximity to shower baths, toilets and stairways. The dressing room section will have its office, store room for suits and towels, safe deposit boxes, laundry, drying and heating rooms and repair shops. The latest types of machinery will be installed in connection with this department.

A concrete swimming tank seventy-five feet wide and three hundred feet long will be constructed on the beach. It will vary in depth from two feet to ten feet. This tank will be one of the very few tanks in the country long enough for the one hundred yard swim, and it is expected that many swimming tournaments will be held here.

The tank will be faced with ceramic tile on sides and bottom and will be equipped with a complete line of swimming apparatus such as spring boards, trapeze, high dive, etc.

A bulkhead will extend across the length of the property and return at each end to enclose and protect the sand beach which will be approximately six hundred feet long by an average width of two hundred feet. The bulkhead to be built of piling, filled in with rock, will be faced on the land side with concrete and will have a twelve-foot promenade on top. A scintillator pier is to extend out one hundred feet from bulkhead on axis with Webster street.

A number of concessions have already contracted to build at Surf Beach.

The L. A. Thompson Co. will start construction at once on a racing coaster six hundred feet long, the largest in the United States. There will be a carrousel, a playground for children equipped with sand boxes, see-saws, circular gravity swings and a nursery, and many other amusement features. In addition, there will be a large hotel of the resort type containing two hundred rooms, restaurant, grill, ball room and a large lobby.

Architect Edwin J. Symmes, supervising architect of concessions of the Exposition and one of the designers in charge of state and foreign pavilions, is the official architect of Surf Beach and has charge of all construction, including concessions.

* * *

A Monumental Mausoleum

The most ambitious plans so far conceived for any community mausoleum are now being prepared by B. J. S. Cahill, architect of San Francisco, for the Pacific Mausoleum Company of Oakland. The building will cover an area of 40,000 square feet. It will contain over a thousand crypts and as many niches. The building will be unique in many particulars and conceived on truly monumental lines. The new building will be erected in Laurel View Cemetery, Alameda county, and will be constructed of reinforced concrete, marble, stone and bronze. It will cost approximately $125,000. Mr. Cahill has had considerable experience in this line of work, notable among many others being the recently finished community mausoleum for Cypress Lawn Cemetery.

San Francisco Contractors Adverse to Preservation of Fine Arts Building

THE General Contractors Committee on the Preservation of the Fine Arts Building, which proved one of the most popular of the Exposition buildings, has reported adversely to preserving the structure, taking the stand that the outside stucco is not of lasting qualities and could not very well be made permanent. Also that the building would look out of place when the other Exposition structures now surrounding it are replaced by factories and other industrial plants.

The committee was composed of Messrs. D. B. Farquharson, Ralph McLeran and Grant Fee, and the report in part is as follows:

After careful consideration, we are satisfied that any attempt to preserve this building after the closing of the Exposition would entail a prohibitive expense and would not give the pleasure or satisfaction anticipated when the setting is removed. While it is true that the main building has a pile foundation, a steel frame and metal lath with first coat or coatings of a Portland cement plaster, the surface or exterior coating, as well as all columns, corners and enrichment, are of a plaster of Paris or similar material, which material will not stand exposure to the weather for more than two or three seasons without disintegration unless the surface be entirely filled or waterproofed with a lead and oil paint, or other enduring form of damp-proofing, of which your committee has no knowledge; all damp-proofings known to your committee suitable for the requirements of this building are so quickly evaporated on exposure to the air that they lack any quality of permanent damp-resisting surface. That is, assuming that the surfaces would remain free from cracks and the joints from opening—which will not be the case, nor is there any way of securing this result. Further, the rough surface of the plastering and the rough and peculiarly porous nature of the cast work that make a large part of the pleasing surface effect at present, add a further insuperable difficulty to any effective attempt at securing a waterproof wearing surface.

With regard to the colonnade: The framing of this structure is of Oregon pine, which material, while amply strong and enduring if kept dry, would only be good for three or four years where it gets wet and is not fully ventilated, which, in a construction of this nature, it would be impossible to secure.

So far as the plastering, columns, etc., of this part of the building are concerned, the same criticism applies as in the main building.

Furthermore, what of the building when the setting is removed? While recognizing the grandeur and excellence of the design with the perfection of its proportion and detail, still, to a great bulk of observers, a large part of the charm of the building is in the general effect secured by a fitting background or foreground, as you will, proportioned in some scale or degree with the Fine Arts Building itself or at least not wholly out of keeping with it. For example, with the removal of the Food Products Building and the Educational Building, what could the owners of that property be induced to put in their place that would be at all in keeping or that would not be an aggravated eyesore owing to the Fine Arts Building being so near at hand, making the whole effect a disappointment rather than a source of pleasure? Suppose it were possible to buy enough ground and put a screen of high eucalyptus trees, gathered from other parts of the grounds along this front, would the owners of the rest of the property consent to be cut off from the main street by such a miniature forest? We think not, with the present or near future development of this part of the city.

The charm of the Fine Arts Building, in spite of its inherent excellencies, all of which the committee willingly accord to this building, would be lost if faced by a street of indifferent frame factory structures, with their necessary surroundings, on one side, and a bare parade ground on the other.

Since, at the best, the Fine Arts Building can only be maintained for a very few years in an indifferent condition, we deem it unwise to create any hopes or expectations that could only lead to disappointment and possibly ill feeling through the frittering away of a considerable fund of money that, in our judgment, might be used to better advantage in the creating of a worthily fitting and permanent memorial of our great Exposition.

In view of these facts, your committee, however reluctantly, recommends positively against any attempts to preserve the present Fine Arts Building.

(Signed) D. B. FARQUHARSON
RALPH McLERAN
GRANT FEE.

Willis Polk deplores the action of the Contractors' Association and Institute Chapter in discouraging any plan for the preservation of any or all of the main buildings. Polk said before the Commonwealth Club:

> When we talk about preserving some feature in the fair, do not let us take a narrow-minded view of what we can do, because there is nothing that we cannot do.
>
> If we try to save the Fine Arts Building and fail, then the joke would be on us. But if we say that we cannot, of course we will not. If we say "All that we can do is to save the Marina"—Good Lord! Anybody could do that. God himself made it—it is there—ours for keeps. That is all I wanted to say. I would say, however, save everything; let us be as big and as brave as possible, and demand it all, and be thankful for what we get.

Louis C. Mullgardt spoke in the same enthusiastic vein before the Commonwealth Club. He said:

> Mr. Polk has ably commented on the preservation of the Exposition. My opinion is also that it would be most economical to save the general plan for an indefinite period. I know positively that it is possible to preserve these buildings for a number of years, and that the relative cost, as compared to the benefits which would accrue to the community and state, would be very small. When the Exposition buildings are torn down, then we will have destroyed one of the greatest architectural units which has ever been created in the history of the world. As it stands, it has cost us many millions of dollars, the residuary value of which will be completely wiped out when the main composition is destroyed. Single structures, avenues, drives and park land do not constitute a creative result of great conquest. The tearing down of the main group will result in a sacrifice of the principal asset which has an international value so diversified and great that it cannot be estimated. Park land and driveways cannot constitute a heritage of the Exposition, as they are mere substitutes of commonplace importance, which would, in the natural course of events, come, as the commonplace usually does.
>
> The buildings as they stand are as usable after the termination of the Exposition period as they are at the present time. At present they are being used for commercial purposes. They can be protected against fire and disintegration. Repairs will, as a matter of course, be necessary, as is true of all buildings. This group of buildings constitutes the finest single composition that the world possesses today. They can be made to provide continued pleasure, enlightenment, and profit as they have during the past eight months, at relatively small expense. If we pull them down the possibility of heritage is lost. Nothing can take their place which will serve as an international attraction to our city unless we spend the same amount of energy and money to reestablish a similar result.

The Exposition authorities have decided to keep the Fine Arts Building open for at least another four months, and in the meantime something may be done to preserve the beautiful structure.

* * *

Architectural Features in Design

Engineers in this country should exert more influence in the development of architecturally pleasing effects in the design of structures than they have done in the past. Frequently the pressure brought to bear upon them by owners or officials of corporations and municipalities who control the design of engineering construction and insist upon mere utility and, sometimes, upon lowest first cost, is hard to resist. It is encouraging to note cases in which this pressure has been successfully resisted and overcome. Engineering work should not be wholly utilitarian. In all cases where natural surroundings require it, where the consistent development of a great architectural plan is possible, or where the presence of appreciative observers is probable, the element of general architectural appearance should be given consideration. We are still far behind European engineers in this respect. Surely the great natural wealth of this country can be better applied in this direction than we have yet succeeded in applying it.—Engineering Record.

The Building Business as a Factor in the Commercial Life of the Country

By MR. CHAS. W. GINDELE*

IN accepting your kind invitation to address you upon the subject of "The Building Business as a Factor in the Commercial Life of the Country," I felt that the committee who selected the titles for the various subjects to be essayed and discussed had signally honored the city of Chicago in assigning to me, as its representative, a so highly important subject. Being merely a contractor, and one who has not had the time to devote to a thorough study of matters of this nature, I fear I may not be able to do the subject justice. Coming here as the official representative of the Building Construction Employers' Association of Chicago, I feel it incumbent upon me, however, to at least attempt to properly present my reasons for sincerely believing that the building business is decidedly a very important factor in the commercial life of the country.

The "Windy City," as our town is often called, fully realizes this fact and can give many reasons for its belief. Chicago, great as it is today, could not have reached its present position in the building and commercial world, were it not for the progressiveness of its building interests and the close affiliation of those interests with the city in the development of its commercial life. Situated in the midst of the verdant prairies of a great state, radiant with golden wheat and with a soil fertile in its production of food products; lying majestically upon the shores of a great inland sea, drawing to it the commercial activities resultant from an almost resourceless production of the farm, the mine, the quarry and the factory; a busy city teeming with bee-hives of industry and with more than a million wage-earners keeping pace with the rapid strides of its commercial life.

Strangers coming to our city often wonder whence we derive the name "Windy City," and I have often been asked that question. It is true that sometimes the wind does blow in Chicago, but not nearly as much as it does in some other cities I have visited. Perhaps it derives its name from that fact alone, and perhaps the responsibility rests with the great political parties, holding their conventions in our city at which both Theodore Roosevelt and William Jennings Bryan have been talking. Again, perhaps some strangers in town have encountered the wind from the southwest when the beautiful odor of the stock-yards, one of our chief industries, was wafted over the city with the gentle breezes. Again, it may be a fact that the success and progress of the city of Chicago financially, commercially and in population is due to the windiness of its inhabitants in blowing the town horn.

I have been a resident of Chicago for more than 63 years and have been actively engaged in the building business for some 47 years. I have watched the progress of the city in its population, building and commercial life and have witnessed its growth from a city of less than 50,000 inhabitants with its unpaved streets, no grade, no building line and uncouth appearance, to a city of more than 2,500,000 with a magnificent array of well-built edifices, a vast system of boulevards, well-paved and well-kept streets, a twentieth century city in every respect. Many who are here to-day will recall that eventful day in October, 1871, when the now celebrated Mother O'Leary's cow was reputed to have kicked over the lamp that

* President of the Building Construction Employers' Association of Chicago. Paper read during American Builders' Week, San Francisco, California, October 18th to 23rd.

resulted in almost wiping out the city of Chicago. The conflagration started on the west side of the city, and fanned by a high wind spread rapidly, crossing the river into the very heart of the business district and almost totally destroying that section. The building business as a factor in Chicago's commercial life, was very forcibly illustrated at that time. The city then was an overgrown town, built without considering the necessity of adopting proper measures to prevent the loss of property from fire and other destructive forces. Nearly all of the residence portion was built of wood, and in the down-town district more than half the business blocks were of frame construction. When the fire attained such proportions that it could not be stopped, the only recourse was to blow up the buildings, checking its progress and letting it spend itself. The destruction of the city at that time, deplorable as it may seem, was, in a measure, a blessing to the town and its people.

Rising Phoenix-like from the ashes, a new Chicago was born, a city not for a day nor a year, but a city that would endure; a city that would withstand the acts of the elements, a city that would inspire its inhabitants to do better things, to live and build upon a higher plane of safety and comfort, a city that would take care of its industries, its people and its commercial life and one that would say to the people of the world, "come within our fold and grow and prosper with us." I cite these instances because I believe Chicago would not be what it is today, had not its great fire served as a lesson, and a warning to build better and safer in order to protect its people and foster its commercial life.

In using the word "Builder," I am using the same in its broadest sense and include in the term the architect, engineer, contractor and material interests. I also may be pardoned for referring so frequently to my home city, Chicago. I am using it as an illustration, and its experiences and results are applicable to other cities and the country at large. The lesson of "1871" in Chicago anchored in the Builder a desire to help his stricken city to rebuild upon a firmer foundation and a zone of safety for the commercial life of that fast growing city, the result being that brick and stone supplanted wood as the chief ingredient in buildings of four or five stories in the business district, thus striking the keynote for better construction and better buildings. At that time the ability of those engaged in the building business was tested to the limit. Our neighboring sister city of St. Louis was then pressing Chicago pretty hard, both for business and population. Within a radius of a thousand miles of both cities was a territory booming with small factories and an abundance of crops, the prosperous manufacturer and farmer seeking a market for their product and a center in which to do their trading and concentrate their commercial life. The immediate necessity of building thousands of buildings to house this commercial life and save it for the city called for prompt action, quick delivery, skill and ingenuity in the construction of a modern type of building, and one sure to withstand the ravages of another possible great conflagration. The builders of the city of Chicago, alive to the imperative needs of the commercial interests, as well as the domestic life of the people, succeeded in restoring conditions sufficient to meet the requirements in a remarkably short time and with practically no outside aid in construction work. The experience of Chicago was similar to that of Boston and later the city of San Francisco when a large number of its buildings were destroyed by tremors of the earth and fire. These lessons, costly as they may be, are lessons which must be studied and profited by. They teach us "safety first" and "watch our step" through the channels of

progress both in domestic and commercial life. The result of these great lessons to these communities, naturally, served to prompt a more careful study of conditions and point out the necessity of evolving some process of construction that would resist the attacks of conflagration and other destructive elements and at the same time insure to the people safe conditions for their domestic life, with proper and staple housing for the needs of their commercial life.

The evolution of the building business since the Chicago and Boston fires has been rapid and wonderful. Fire limits have been extended, frame buildings almost barred, excepting upon the extreme limits of these cities. Brick and stone superseding wood and iron, steel, concrete and other products being used in the modern method of constructing buildings, thus insuring proper protection for the commercial life of the community. The commercial life of these cities could not have grown to any great proportions had their existence been daily threatened by the ravages of fire and other destructive elements. The commercial interests of our country devoted to their own particular lines of industry, give individual attention to the needs and requirements of their business. Their function in commercial life is to manufacture, produce, buy and trade, to cater to the people's needs and wants. To them, the matter of buying, selling and trading is their life, their purpose and their sole thought.

In order to manfacture their product they must have the proper facilities to do so and adequate space for the housing and handling of same. Upon their business ability depends the success of the commercial life of any city, state and nation, but very essential to that success is the skill of the Builder* in designing the building and the skill of the artisan in constructing the same. Like the commercial man, the Builder must devote his thoughts, his time and his ability towards designing and erecting structures that will meet the requirements of the commercial life of the community. They must build the factory, the warehouse, the store and places of abode for the people. In the evolution of the building industry, it was the builder who demonstrated the utility of steel in buildings; it was his fore-thought and study of the acts of the elements which suggested the necessity of erecting buildings for commercial purposes which would be as nearly fireproof and indestructible as it was possible to make them. The use of steel, concrete and other clay products permitted the builder to do this and through the medium of these products, the modern building of today is possible. The co-operation of the forces of both the commercial life and the building life of the nation, looking toward the betterment of conditions and the welfare of the nation, can produce results which will add to the glories of both and make the success of each, tantamount to the success and progress of the nation. Comparing the modern system of building with that of even a quarter of a century ago, is like comparing the present day with that period before Morse invented his code of telegraphy, Bell his telephone and Edison demonstrated the power of electricity. Ground areas for buildings have decreased because the use of steel permits the erection of buildings towering toward the heavens two or three hundred feet and built as solid as the rock of Gibraltar. Many buildings in our city formerly occupied a ground space of 40x80 feet, three or four stories high and housing approximately three or four hundred workers. In the commercial life today, upon the same area, may stand a modern steel fireproof building, sixteen to twenty stories high and under its roof may be employed two or three

*Editor's Note—The author evidently has used the word Builder in a very broad sense and he doubtless had in mind the architect when referring to the designing of structures.

thousand workers in the commercial life of the city. Great cities are built today not upon a vastness of ground area, but with the thought in mind that the needs of the people, particularly in the commercial and industrial life, require the concentration of that life's various units into a smaller and more accessible working area. The business districts of all large cities demonstrate this fact, the tendency in all of them being to build larger and better buildings for the expansion of their commercial life.

The building business is a factor in the commercial life of the country, and is a natural barometer of the life and activity of any community. It is the builder who erects the edifice that makes a community known, who helps make the commercial life of any community by making it a safe and sanitary place in which to live and do business; it is due to the ingenuity and skill of those engaged in the building business, that a community is made attractive and substantial with splendid structures to grace its highways; it is the building business that gives to the community assurance of safety and comfort in the home, the office, the factory and in the place of worship, it is the building business that adds to the stability of any community, by its careful study of modern methods of construction and the eye of the builder in so drawing the architectural lines as to insure the making of "a city beautiful." The prosperity of any one of our cities and its activity in commercial life can be safely gauged by the condition of the building business in any particular community. A dullness in the commercial life of any city will invariably show a falling off in building and likewise the opening up of the building business will be followed immediately with a corresponding increase in the volume of business of the commercial life of the city.

The great increase in the commercial life of our country is, in my estimation, due to the great strides that have been made in the building industry. The builder realizes, that, like the business, a structure must have a firm and solid foundation, and like the business, in order to endure, the super-structure must be reinforced with substantial units bound in a cohesive mass and solidified in order to stand the ravages of time and to withstand unforeseen forces of destruction.

"Not without thy wondrous story, could be writ the nation's glory"—So run the lines of a song entitled "Illinois," and so it might be said of the builders of America, "not without **thy** wondrous story, could be writ the nation's glory." The Builders of America one hundred and fifty years ago were pioneers in the development of the nation's commercial life; patriotic to the core they entered into the work of building a nation and giving to mankind a place of refuge and peace in a land of abundance and plenty. These builders helped build a nation upon a foundation of principle and of right, justice and freedom to all. A constitution that has never had a single plank repaired since they were dove-tailed with the other units in that magnificent piece of work.

The Carpenters' Hall built a century and a half ago still stands in the City of Brotherly Love, and Independence Hall from whose dome the old Liberty Bell pealed forth that sweet music of independence, is still standing as a silent monument to the ingenuity and skill of the builders of "1776." Through the broad expanse of the nation, reaching to all points of the compass, stand upon every highway, in every city and spanning every river, everlasting monuments to the skill and ingenuity of the American Builder; monuments that will endure, monuments that will teach to the world and its children the lessons of progress, thrift and the achievements of the modern builder and his part in building up the

nation as well as making the commercial life of the country the great and prosperous one that it is. The builder of today, unconscious of the importance of his industry to the commercial life of the country, is proud of his achievements and hopes that the builders of tomorrow and the great future, will profit by his experience and endeavor to be the builders of greater cities and a greater nation in common with those who are fostering and increasing the commercial life of the country.

* * *

Sandstone an Old Favorite

One of the varieties of stone that has been in important use for structural and decorative purposes ever since the dawn of civilization is sandstone. This is of very wide occurrence, being found in almost every country, and it has such diversity of color and texture that it would naturally be chosen for architectural use, says Stone. Besides its beauty, sandstone has been commended to the builder by its great durability and its resistance to attacks by fire and the acids of the atmosphere. Many of the most notable buildings that have come down from antiquity are of sandstone. Temples and statues in ancient Egypt were cut in this material, although the patient craftsmen were just as willing to carve limestone, granite, or even the intractable basalt and porphyry.

In Persia and the various countries of Asia Minor, gigantic structures were reared in sandstone, the ruins of which have survived to awaken our admiration and wonder. The remarkable rock-cut temples and tombs of Arabia Petra are carved entirely from great cliffs of sandstone. The stone is a beautiful and delicate pink in color, with occasional markings in yellow, and the effect of rich carvings in such a material can scarcely be imagined.

In later times, sandstone was used very generally for cathedrals and churches in England and on the continent. This made it possible to produce effects not only in stone of yellow and gray, but also in brown, pink and red, and striking contrasts were available. It is only within the last few years that the present generation has learned the lesson of the excellent effects of polychromatic construction which might have been drawn long ago from the work of our forefathers. The varying colors of marble and sandstone enable them freely to apply polychromy, both structural and decorative.—Exchange.

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Publisher of Architectural Record is Dead

A CURIOUS coincidence was the death, almost simultaneously, last month of the publishers of this country's two foremost architectural publications. On November 10th, at New York City, Mr. Frederick Warren Dodge of the Architectural Record passed away, aged 51 years. Ten days later the death of Colonel Edmund M. C. Whitney of The Architect and Engineer occurred at his Redwood City home. Colonel Whitney was 57. Both he and Mr. Dodge began their careers as publishers at about the same time.

Mr. Dodge was born at Melrose, Mass. He was descended from old New England families on both his father's and his mother's side. In 1891 he founded the F. W. Dodge Company, publishers of The Architectural Record, The Record and Guide, and Sweet's Catalogue.

Mr. Dodge was married in 1900 to Mrs. Emily S. Spofford, who survives him. He also leaves a half-brother, F. T. Miller, who was associated with him. He was a member of the Lotus Club, Puritan Lodge, F. and A. M., and the Methodist church, of which his grandfather and great grandfather had been ministers. He was interested in many charities.

Bonding the Builder

By HENRY A. JACOBS

THE subject "Bonding the Builder," while apparently rather limited in its scope, nevertheless upon a careful consideration broadens to such an extent that we find ourselves reaching out into a discussion of the various conditions, contracts and agreements, as security for which bonds are required.

Bonding in general is of a very much earlier origin by far than the recognition of particular contracts relating to building and the improvement of realty in general, and as such requiring special legislation. Unquestionably there must have been great need for the enactment of laws to protect not only an owner of real property, but the contractor and all persons dealing either directly or indirectly with both the owner and the contractor, for we find that such special legislation was thought of and laws enacted by the different states in this Union as early as 1791. Laws of this character protecting builders, materialmen, laborers, etc., were originally thought of and found to be necessary by the various states, the object of such laws being to create a lien upon the property improved in favor of the person who gives value either by way of labor or materials. Its origin seems to have been brought about by the necessity in a young and growing country of fostering mechanical and industrial pursuits, and to secure payment to the builder and workman who furnished funds for the improvement of real estate, when such funds were expended upon it. The expediency of encouraging the building of towns and cities and to assure protection to the persons who were for the most part poorly able to sustain loss incident to business, gave birth to this system, and while there has been continual litigation relative to the protection contemplated by the enactment of these statutes, it is nevertheless a well recognized fact that the law intends to create protection in favor of the mechanic, materialman, artisan and laborer. The creation and enactment of these laws in the different states was not uniform but they were enacted by each community in order to fulfill the requirements, as they so deemed them, of their particular needs.

It will unquestionably be of interest to you to know that the first attempt to create a mechanic's lien arose from a desire to establish and improve as speedily as possible the City of Washington as the permanent seat of the Government of the United States. At a meeting, September 8, 1791, of the Commissioners appointed for this purpose at which both Thomas Jefferson and James Madison were present, a memorial was adopted urging the Assembly of Maryland to pass an act securing to master builders a lien on the houses erected and the land occupied, which was during the same year followed by the passage of a law as requested. The next statute on the subject was apparently passed by the legislature of Pennsylvania in 1803, and so on, the different states, all recognizing the necessity of protection to the persons engaged in the actual improvement of the Commonwealth, have each enacted statutes of like character. Necessarily these statutes were rather meagre in comparison with the laws of the different states of today.

The lien created by statute was designed in its inception to protect the principal contractor, until the frauds perpetrated upon sub-contractors, workmen and materialmen necessitated the enactment of amendments so as to deal justly by all. The result of creating a lien upon the property of an owner whereby such owner could be called upon to pay an amount, in

many instances greatly in excess of his original contract price was, that such owner must in like manner endeavor to protect himself, so that the cost of his improvements would not exceed the amount which he had appropriated for this work. The only protection which was afforded him was either the employment of responsible contractors, who, in the event that they had agreed to perform their contract for an amount less than the actual value of the work, could and would respond and sustain the loss brought about by their own mistake, or to require such contractor or contractors to execute a bond providing for the fulfillment of the conditions of such contract, or better still to obtain both a responsible contractor and a bond.

The practice of requiring security on the part of a person who had agreed to perform an obligation is of ancient origin and when this security consists of an instrument in writing, whereby one doth bind himself to another to pay a sum of money, or do some other act, such instrument is called a bond. A bond of this simple character, wherein there is a direct promise to pay a specified amount upon the fulfillment of a certain, or other conditions, is universally known as a common law bond, and relates back to the old English periods wherein laws were considered such laws by reason of custom and usage. Even at the present time, such bonds are recognized as one of the best forms of bond, and I feel safe in stating that a bond of this character, properly drawn and executed, more safely guards the interest of the person in whose favor it is drawn, than many forms of statutory bonds now required.

Early in the history of mechanics' liens, courts have universally held that liens could not be filed against public property as public policy would not permit the same. It then became necessary to devise other means of protecting the persons furnishing materials or performing labor upon this class of work. Accordingly special laws were enacted compelling the contractor to furnish a bond, not only providing for the fulfillment of the terms and conditions of his contract, but also providing for the payment in full to all persons who either furnished materials or supplies, or bestowed labor upon the work. This class of bonds have been created particularly for contracts relating to public work. These bonds have been, not only of great legal, but also of great moral effect, and have given a very much needed protection to the persons engaged in the building industry. In some states the same form of bond as required upon public work, has also been included as one of the requirements of the mechanics' lien statute. Decisions have not been altogether uniform as to the legality of this form of bond, when required of private owners as a condition in order to protect such owner from the liens of mechanics, materialmen, artisans and laborers. In this state such a bond has been held unconstitutional, while in other states to the contrary. As to the public work, however, I understand all states have invariably held the same to be constitutional.

The matter of contracting, has during the history of this country, been a source for the perpetration of many frauds. As I have stated, in order to overcome these frauds which were discovered to be possible, even in the earlier history of our country, attempts were made to enact laws giving protection to the persons upon whom such fraud might be attempted. The laws at first did not give to the parties for whose purpose they were enacted, the full protection that was intended, and after a gradual evolution it was found that two systems of lien laws had arisen; one creating a direct lien upon the thing improved for the actual value of the improvements placed thereon; the other limiting the lien to the contract price. The first system

providing for the direct lien is commonly known as the Pennsylvania system, and while to some extent stringent, and compelling the owner to beware of irresponsible contractors, or to require sufficient bonds, has proven very beneficial and avoided a large amount of litigation. The latter system, known as the New York system, even to this day is very complicated, and neither the owner nor the persons who have improved the property, are able to determine with any certainty their exact status in the event of any differences arising in the performance of the contract. In this state we have recently amended our mechanics' lien statute, which heretofore was drafted upon the New York, or limited lien, and in lieu thereof created a direct lien according to the Pennsylvania system.

Our law provides further for the execution of a bond by the contractor in favor not only of the owner, but inuring also to the benefit of all persons who shall furnish labor or material in the performance of the work. This bond is not obligatory, but the owner may, if he desires to protect himself from a direct lien, require such a bond from the contractor, and in that event, his liability is to be limited to the contract price. This bond, we claim, is different from the former bond heretofore held to be unconstitutional by our Supreme Court, in that it does not exact this from the owner, but instead, makes it a matter of privilege so that the owner can limit his liability to avoid the consequences of a direct lien.

The question of the validity and constitutionality both of our direct lien, and of this bond are now before our Supreme Court and we, who are supporters of this act, have no doubt that the constitutionality of the direct lien will be upheld, and are in hopes that the provisions relative to the bond will likewise be sustained, thereby saving considerable vexatious and expensive litigation to those who derive their livelihood from the building business.

It is safe to say, however, that a contractor who has established himself upon a firm and substantial basis will not object to executing a bond in favor of all persons who might become involved by reason of his operations, and that, if not only the builder, but the architect who acts as the agent of the owner, the owner individually, and all persons, will enter into a reasonable contract, providing for reasonable security, that everyone who invests either their labor or their funds in these contracts, will be fully protected and much litigation avoided.

* * *

Had Not Waited

In Montana a railroad bridge had been destroyed by fire and it was necessary to replace it. The bridge engineer and his staff were ordered in haste to the place. Two days later came the superintendent of the division. Alighting from his private car, he encountered the old master bridge builder.

"Bill," said the superintendent—and the words quivered with energy—"I want this job rushed. Every hour's delay costs the company money. Have you got the engineer's plans for the new bridge?"

"I don't know," said the bridge builder, "whether the engineer has the picture drawed yet or not, but the bridge is up and the trains is passin' over it."—Harper's Magazine.

Get Details Before Signing Contract

THE difficulty of obtaining full detailed information of what is really wanted when bidding upon work is one of the serious problems which confronts the contractor today, for it is largely detail which determines what work is really worth, says the Contract Record.

Ordinarily small scale drawings and specifications certainly do not sufficiently disclose what may be insisted upon, in detail, after a bidder has signed a contract. Some owners imagine they do, and that they tell a bidder all that is necessary. Others are indifferent; it is up to the contractors, they think. Others may secretly hope that some things may slip through without being noticed; this is the particular type of owner who is ever ready to profit by a bidder's error.

Of late years, however, there has arisen among contractors a strong desire to know more of what is required before a contract is signed, rather than be obliged to await the details afterwards. In common fairness there should be some way of disclosing the details beforehand, or at least as far as possible, so that all bidders receive reliable and identical data to figure upon. Not only that, but if for any reason the character of any of the details should be simplified, after a contract is let, it would be more likely to serve as a check against any possible unfairness.

Fortunately for the building industry, there are many architects who give, as well as expect, a square deal. These are well known by bidders and they are respected as men and as members of an honorable profession. But it seems to be generally understood that there are "others," and it is from the offices of the latter that contractors obtain a more accurate idea of what is wanted after the contract is signed than before. Then it is too late. Many a contractor has been caused financial difficulty because of the business viewpoint (?) such architects display—not provided for, of course, by any clause in the contract. The better type of contractors avoid the offices of such architects, or, when invited to figure, they discreetly raise their bids high enough to cover possible contingencies.

The point under consideration is whether details should be furnished before or after a contract is let? It is a question raised by Mr. G. Alexander Wright, of San Francisco, and a prominent advocate of the Quantity System.

It is obvious that there can be only one answer to this question. If details are not ready when the job is being figured they should certainly be in the hands of the contractor before he is called upon to sign up. It would surely be a more equitable way of letting a contract. Now as details must be prepared and furnished at some time, is there any logical reason why this should not be done at a time when such information would be of the greatest value to the bidder, i. e., when he is making up his prices? Why keep back vital information? It is not to the bidder's advantage, of course. Who is it that benefits? Is it the owner? Or is it for the greater convenience of the architect? Whatever the reason, can it be regarded as fair to the bidder? It is obvious that an individual bidder is helpless. He cannot force the issue himself. But collectively through their organizations, contractors might make reasonable and proper representations of these facts to their local architects with a view to the betterment of the conditions named.

Certain remedies have been suggested from time to time. One is the quantity system. Some remedy is necessary. One that would seem to afford relief without causing hardship to anyone, would be the passage of city ordinances providing that applications for building permits, for work above a

certain estimated cost, should be accompanied not only by the usual plans and specifications, but by details to a scale of, say, not less than 1½ in. to the foot, or sufficient to indicate the character of the work which is to be performed in detail.

It takes no longer to study the details of a structure before a contract is entered into, than afterwards. It has to be done at some time. The owner, who is so often unduly impatient to see his building started, would soon learn to adapt himself to the new condition, if he realized that his architect was simply conforming to the law. There would be just as many buildings erected, and bidders would understand more clearly what it was they were bidding upon.

* * *

Ornate and Artistic?

A curious misconception is abroad concerning art in school architecture. Many school board members are apparently of the opinion that a building which is not well supplied with decorative detail is inartistic. The same opinion seems to prevail among certain architects. It was voiced recently by a man who complained bitterly of the lack of appreciation for good architecture on the part of a building committee, which had just rejected his rather elaborate design in favor of a simpler and plainer plan. He had provided for expensive cut stone cornices and belt courses on the facade, elaborate marble wainscoting and stucco trim in the corridors and assembly room, and other embellishments. While his general plan was good, such important details as the relation of stairways to corridors and classrooms, the arrangement of toilet rooms, etc., had not been fully studied. His competitor, whose plans were rather plain, had, on the other hand, studied very carefully every feature of his building and had completed a general design which depended upon good proportions and well-chosen materials for its effect.

The highest art in architecture, whether it applies to school buildings, office buildings or homes, involves a blending of the beautiful with the useful, in which no essential of the whole is disregarded. Good architecture in schoolhouses means attention to all the possible educational needs of a building so that no practical detail of plan or construction, and no element of permanence and safety are sacrificed.

Service must be the first ideal of the architect, and beauty must be blended with it, not as something stuck on but as an integral inseparable quality. And that does not mean that embellishment is not necessary or desirable; it rather means that the enrichment of a design should have a true function and should really become a necessary part of it. The best architects understand this and the schoolhouses in such cities as New York, St. Louis and Oakland impress and charm the beholder by the truthfulness and strength of the architectural forms and by their genuine expressiveness of the educational use to which each building is dedicated.

The school board which sticks to simple, honest designs, in which effects are produced by pleasing masses and contours, by harmonious colors and good proportion, and by well-chosen materials, will not fall far short in obtaining an architecturally good school building.—School Board Journal.

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COL. WHITNEY'S BEST MONUMENT

The passing of our beloved Chief, Col. Edmund M. C. Whitney, which occurred on Friday, Nov. 19, was a sad blow to a large circle of personal and business friends in both Eastern and Pacific Coast sections. The avalanche of messages and other testimonials from every part of the country, show how highly Colonel Whitney was esteemed and what a tight hold he had on hundreds of those who knew him more or less intimately. To the circle in the *Architect and Engineer* office the loss is a great personal one, of which even now it is difficult to speak or write without deep emotion.

The long illness of Colonel Whitney, extending over some three years, had permitted his associates of the *Architect and Engineer* to realize how wisely he had planned this publication and upon what definite and permanent lines it had been developed. It had a basis of the solid rock of principle and experience, and the superstructure was one of permanency and strength. The magazine has always stood for the high ideals and loftiest motives. All that was progressive or in line with good construction had a doughty champion in Colonel Whitney, and this policy has been unswervingly adhered to in the three years since he was at the helm.

The future policy of the magazine will not differ from that of the past, excepting as the natural development will show continued improvement. The development of a great newspaper (or magazine) is like the building of a nation—it must have an underlying purpose, a framework of laws, an administration of justice, a growth of ideas. It is at once a moulder of opinion, an advocate of honesty and sincerity, a story of development and progress, a forum for exchange of ideas, an educator in professional and business studies, a panorama of events and a tried and true friend of all its readers. The *Architect and Engineer* will continue to be this to its large circle of subscribers and readers. It will continue to rep-

resent adequately, as it has for ten years past, the great architectural profession and building interests of the Pacific Coast.

LESS UGLY PENT-HOUSES!

We architects do a lot of silly things and not the least silly of them is our shiftless treatment, or lack of treatment, of the topknots of our buildings. The pent-houses and other projections above the roofs of our big buildings, I mean. Not one in a hundred of our structures is supplied with a decent windup or apex. Just because those pent-houses are above the roof, the supposed termination of a building, we indulge in the fond illusion that they are not seen and therefore can be as ugly as they like—the same process of reasoning, or unreasoning, that leads the ostrich, the silliest of all bipeds, to hide his tiny head in the sand and fondly believe his whole great carcass is safely concealed from danger.

In most localities, especially in hilly places, those bleak pent-houses are the most conspicuous features of our buildings; they shriek at us in all their naked ugliness and remain with us long after we've forgotten the perhaps really attractive and artistic features of the buildings they surmount.

Let us save a few dollars from the ornamentation below and expend them upon the pent-house, giving it a little character, finishing it of material not too unlike that of the building itself, making it, if not a delight, at least not as nightmarish as we've been doing; for, verily, the average one looks as if some drunken Zepplinists had dropped some sort of a cheese or cracker-box and it happened to alight on top of that particular building.

F. W. Fitzpatrick.

A SHORT LIFE AND A MERRY ONE

How typical of modern development and modern methods is the passing away of the Exposition and the destruction of the various stucco buildings over which so many panegyrics have been uttered and so many bronze placques bestowed! As we have listened to the tearful utterances of the Honorable Mayor, leading citizens and the Exposition officials as they have eulogized the munificence of the various countries and states which have been responsible for the buildings, we could not but feel that the Jewel City was even then moving towards the melting pot. But is the Exposition alone in its ephemeral existence? Is not much of our building of this perishable character? When we should be building for permanency, are we not sacrificing durability for gingerbread decoration? It is not alone in building that this is true, but in every department of manufacture. We buy an automobile and within a few months consign it to the jitney scrap heap! We invest in a typewriter and before it is fully paid for, our attention is called to its imperfections and we are solicited to buy the "new model." It does seem that the age is one of renewing and replacing (a most extravagant method!) instead of constructing for permanency.

BIDDING FOR A JOB

An interesting method of filling a municipal office is indicated by the following official call for bids, clipped from a paper published in a Texas city of 5,000 population:

For City Health Officer.

Bids will be received September 1, 1915, 9 a. m., from physicians for the position of city health officer. For further particulars see City Secretary.

The duties of this position are not stated, but presumably they are defined in the plans and specifications. The scheme, says Engineering-Contracting, will appeal to economically minded statesmen for by it they can get the cheapest man.

In line with the above a California assemblyman, C. C. McCray of Shasta county, is quoted as saying:

I believe in reducing the cost of county and city government by running the government just like a private business. Let those who want to hold public office send in a bid, say to the supervisors, telling just what sum for which they'd run the office of sheriff, tax collector, treasurer or what not. I believe some of the bids would be for a thousand dollars or more less per year than we now are paying.

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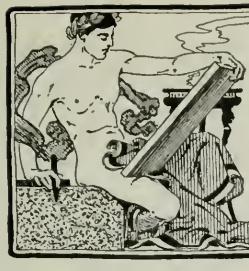
Portland Postoffice Building

Plans have been completed by Lewis P. Hobart of San Francisco for the new $1,000,000 Postoffice building at Portland. It is expected the authorities at Washington will call for bids before the end of this month. The building will be of steel, stone, brick and terra cotta. A general contract is to be let for this work.



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What One Architect Thinks of This Magazine

Editor The Architect and Engineer of California:—Yours received regarding subscription to the above publication. Am sending you three subscriptions or $3, and would like to be notified just before the time expires.

In reply to the question, how I like the Architect and Engineer, perhaps the statement that I have, owing to the continued hard times in this neck of the woods, cut off all other architectural publications but yours, will be a sufficient reply.

Very truly,
Pomona, Cal. FERDINAND DAVIS.

New Architects

Certificates to engage in the practice of architecture in the state of California have been granted by the State Board of Architecture to the following applicants:

Herbert C. Howard, 212 Broadway Central building, Los Angeles; Frank R. Farrar, 1523 Martel street, Los Angeles; Edgar W. Mayberry, 600 Chamber of Commerce building, Pasadena; A. L. Valk, 424 Stimson building, Los Angeles; Frederick Heinlein, 404 Washington building, Los Angeles.

Alex. F. Oakey Very Ill

Friends of Alexander Forbes Oakey, the San Francisco architect, will regret to hear of his recent serious collapse following a stroke of paralysis. Mr. Oakey is now at the City and County Hospital. Mr. Oakey is recognized as one of the best informed architects in acoustics on the Pacific Coast. His series of articles on the subject published in this magazine several years ago were copied extensively throughout the country.

Willis Polk's Broad Mindedness

In these days of keen competition one would not expect an architect to bother about recommending a fellow member of the profession to a prospective client. Commissions have been so scarce that when an architect has learned of a prospect it is not strange he should seek to corral the job for himself. But not so with Willis Polk, the San Francisco architect, who has shown his liberality in the following letter to a Sacramento prospective builder, a letter we are taking the liberty to make public because it seems to provide a splendid example of broadmindedness—an example others may very well emulate:

November 22, 1915.

Dear Sir:

Replying to your valued favor of the 20th inst., in which you state that you are planning to build a new home in Sacramento, and are not sure that a San Francisco office could properly supervise the work on account of the distance.

We beg to advise you that planning and supervision are two distinct functions. Planning of course can be done anywhere; supervision must be done at the site. Successful co-ordination of these two functions depends on central control. Such central control need not be located at any particular point.

The D. O. Mills bank of your city was thus constructed.

We are always pleased to design and build buildings. Our fee in residence work would be ten per cent, plus cost of inspector or superintendent on the job.

In accordance with your request that we recommend other architects to you, it gives us pleasure to suggest the following: Ward & Blohme; Lewis P. Hobart; George W. Kelham; Bakewell & Brown; Bliss & Faville; Louis C. Mullgardt; Walter Ratcliff and John Galen Howard.

Very truly yours,
WILLIS POLK & CO.

Berkeley Fraternity House

W. H. Ratcliffe, Jr., of Berkeley, has made plans for a three-story brick veneer fraternity house to cost $25,000 for the Delta Deutron society.

Solving the Architect's Problems

Editor The Architect and Engineer of California:—Am enclosing a circular lately received from a Cleveland concern. Thought possibly you could use it and my reply, for the edification of California architects. Strikes me as an amazingly simple solution for some of our problems!

Yours very truly,
CHARLES H. BIGGAR.

[Following is the letter in question:]

Dear Sir: Do you like to make lots of money and land big orders? If so we can help you by giving you the right ideas that bring the checks with the big figures. Just order from us a sample collection of our imported post cards, especially published abroad for the use of architects. They give you the right ideas and consequently bring orders and money. Hundreds of architects use our cards and make big money. For instance they have to compete for the construction of a hotel. All they have to do is to glance at our cards, pick out one building, Americanize the design and land the order.

We can send you a sample collection of 150 different imported cards upon which is a duty from 25-50 per cent upon receipt of $3.99 postpaid. They represent French and Italian Renaissance and Gothic, German, English, Spanish, Belgian, Austrian and Russian architecture, etc. The cards can be used in a postcard projector and enlarged. They are much cheaper than books and require smaller space.

[My answer]

Gentlemen: Your theory of the practice of architecture is wonderfully simple. Am surprised that there are any but wealthy architects in the profession. Am sure if so that it is from pure ignorance of up-to-date methods.

Moral:—Buy postcards.

P. S.—I have six thousand post cards of European architecture and was beaten in a recent competition. Strange, isn't it? Perhaps my "Americanizer" is out of order. C. H. B.

Another Oakland Theater

Oakland is to have still another moving picture theater. A contract has been awarded to the Van Sant-Houghton Company of San Francisco for the reconstruction of the old Athletic building at Seventeenth street and San Pablo avenue, Oakland, the property of the Charles Heeseman estate. The plans were prepared by Architect Carl Werner, Phelan building, San Francisco. The building is five stories and of somewhat antiquated design. It will be thoroughly modernized and a moving picture theater with a seating capacity of 2000 persons will be constructed.

Forest Hill Home

Clarkson Swain, 520 Clunie building, San Francisco, has completed plans for a $7,500 house for William Larkins, to be erected in Forest Hill. There will be quite a little concrete work, the house resting on a sloping lot. The frame work will be timber, covered with metal lath and plaster, shingle roof, hardwood floors, etc.

Chapel for Menlo Park

Messrs. Shea & Lofquist of San Francisco are preparing working drawings for a steel and brick chapel to cost $100,000 and to be erected in Menlo Park for St. Patrick's Seminary.

State Buildings Sell for Song

State buildings at the Panama-Pacific Exposition are going under the hammer fast. Most of them have now been disposed of at prices that run from little to nothing. The State of Illinois' splendid palace, that cost $92,000 to build, has been knocked down to a wrecking company for $1730.

The New York City building, costing $34,000, has been acquired by a wrecker for $300. The Washington State building, costing $45,000, sold for $800.

The Mississippi building, cost $13,000, brought $225. The Idaho building, cost $16,000, sold for $270. The Texas building, erected at a cost of $10,000, went to a wrecker for $225. Its furniture is to be sent to Texas to be given to charitable institutions. The Iowa building, cost $28,000, brought $500.

Hospital Building for Los Angeles

Harold Gross, 123 South Dillon street, Los Angeles, is preparing plans for a hospital building to be erected by the Kings' Hospital Association, which was recently incorporated with a capital stock of $200,000. The proposed building will be one story, with large patio and will contain about 100 private rooms for patients, operating rooms, kitchens, offices and reception rooms. The construction will probably be concrete and stucco with tile roof, steam heat and all modern hospital equipment. Dr. Henry D. Keyes, 900 Investment building, is at the head of the enterprise.

Architect Headman Busy

August G. Headman, formerly of Righetti & Headman, San Francisco, is exceptionally busy now. He has completed plans for a class "A" commercial garage to cost $35,000 and to be erected on Bush street, between Powell and Mason streets, for Mr. F. J. Bigelow. Mr. Headman has also made plans for alterations to B. Hermann Sons' Market, and bids have been taken for a one-story market building, 30x100 feet, to be erected on Taylor street, south of Washington, for Mr. A. H. Rochfort.

Factory and Warehouse

The Workman Packing Company has had plans prepared by Smith O'Brien, the San Francisco architect, for a one-story reinforced concrete factory building, to be erected on the west side of Seventh street, south of Harrison, San Francisco. Building will have a frontage of 175 feet and will be used for factory, warehouse and office purposes. The cost will be approximately $25,000.

Milpitas School House

Frank D. Wolfe of San Jose has been selected as the architect for a $12,500 school house to be erected at Milpitas. The Mission style of architecture will be followed.

The Plaster Work of the Expositions

The entertainment feature of a recent meeting of the Southern California chapter of the American Institute of Architects was an address by Mr. Thomas Fellows entitled "From the Stones of Venice to the Plaster of the Expositions of California of 1915."

Mr. Fellows gave a very graphic description of his impressions of the architecture of the San Francisco exposition and introduced in a novel way musical selections which expressed his feelings, as he declared, better than words. Mr. Fellows asserted that the treatment of plastered surfaces, particularly for residences, was opening a new era in architecture and predicted that the architecture of the San Francisco exposition would have a powerful influence upon the architecture of the near future. New methods of treatment of plastered surfaces, devised by himself, were explained by Mr. Fellows and illustrated. His method is to produce natural stone textures by the use of crushed minerals of various shades and colors spread upon plastered surfaces by air pressure.

Personal

Oscar Ford, a prominent engineering contractor of Riverside, has been re-elected mayor of that city, Mr. Ford being elected by a majority of just forty-one votes.

The architectural firm of Withey & Davis, Los Angeles, composed of H. F. Withey and J. Pierpont Davis, has been dissolved by mutual consent. Each will continue in business separately, Mr. Withey having opened offices in suite 1017 Van Nuys building, and Mr. Davis in suite 621 Exchange building.

George W. Kelham, architect of the new million-dollar Carnegie Library in San Francisco, has returned from the East, where he went to attend the funeral of his mother, who died in California in the early part of November.

Ralph Wyckoff, formerly with W. H. Weeks, and for the past year practicing for himself in Berkeley, has succeeded to the business of H. B. Douglas at Watsonville, and Mr. Wyckoff will make his future home there. He has plans under way for a school house, garage and other buildings.

Concrete Apartment House

A seven-story reinforced concrete apartment house is to be constructed on the southeast corner of Greenwich and Larkin streets, San Francisco, from plans by Architect J. C. Hladik, 825 Monadnock building, San Francisco. The owner is Dr. Leonard Stocking, superintendent of the State Hospital at Agnew. Building is to be class "B" with reinforced concrete walls, floors and roof. The cost will run in the neighborhood of $60,000.

Two Million Dollars Worth of Work

Willis Polk, the San Francisco architect, has more than $2,000,000 worth of work under construction or in prospect. This includes a 12-story building for the Western Union Telegraph Company, reconstruction of the old Pacific Union Club building, country residence for Agnes M. Born, city home for Mrs. Andrew Welsh, and numerous smaller commissions.

Oakland Apartment House

Mrs. Nevada L. Rudolph will build a three-story frame and plaster apartment house on the southwest corner of Statten avenue and Belmont street, Oakland, from plans by J. Henry Boehrer. Building will cost about $22,000. The same architect has completed plans for a one-story brick store building to be erected at Ashby and Telegraph avenues for Mr. J. H. Wright.

Los Angeles Market Building

Los Angeles is to have an immense market building from plans now being worked out by John Parkinson. The project will also include the construction of wholesale and warehouse buildings, six stories high, and covering more than an entire block. The promoters are the Los Angeles Public Market Company and the Pacific Electric Railway interests.

Stone & Wright to Design Lodi School

The grammar school board at Lodi have adopted the plans of Messrs. Stone & Wright of Stockton for the proposed grammar school building. It will cost $30,000 and will consist of six class rooms, assembly hall and necessary adjuncts. It will probably be a veneered brick building, with class rooms all on one floor.

Big Factory for Berkeley

The Peet Manufacturing Company, 444 Market street, San Francisco, will erect a group of factory buildings at Third and Pardee streets in Berkeley for the manufacture of soap and glycerine. The first building to be erected will be of brick with wood floors and joists and will cost in the neighborhood of $100,000.

Banker to Build Home

John H. Powers, the San Francisco architect, has prepared plans for a $20,000 city residence for Mr. R. A. Sbarboro, of the Bank of Italy. The house will be in the Italian style with hardwood interior finish and stucco exterior. The location is Divisadero and Green streets.

Los Angeles Hospital Group

Plans are being prepared by George Low, county superintendent of construction, for a group of hospital buildings for the city and county of Los Angeles to cost in the neighborhood of $500,000.

Splendid Hotel for Lake Tahoe

One of the interesting landmarks of California, the old Hotel Tallac, on the shores of Lake Tahoe, is soon to be razed to the ground. The new and modern Hotel Tallac will be started next April or May, as soon as the snows have melted in the mountains.

Anita M. Baldwin, who, through the death of her father, E. J. Baldwin, in 1909, became the owner of all the lands of the Hotel Tallac property, is the projector of the new hostelry. Walter Webber, Los Angeles architect, is now preparing plans for the structure, which will have a frame of reinforced concrete and will have extreme dimensions of 360 by 275 feet. It will have a three-story central portion, two two-story wings, and a two-story and mezzanine rear extension running back on an "L." The exterior will be faced with rough granite.

Steel Towers for Radio Station, Guam

The Bureau of Yards and Docks of the Navy Department is now calling for bids for two steel towers for the high power radio station at Guam. Each tower will be approximately 400 feet in height, of the self-supporting type, triangular in plan, the base of each leg forming the corner of a triangle 90 feet on each side in plan. Each tower will be supported by and anchored to a concrete foundation. Insulating devices will be furnished and installed by the contractor, as well as lightning protection, winches, operating platform and ladders. The total net weight of the two towers is estimated at 480,000 pounds.

The radio station is located on Mount Tonjo at an altitude of about 1,000 feet above sea level and is about six and one-half miles from Piti. Bids for the two towers will be received until 11 a. m., January 8, by Bureau of Yards and Docks, Washington, D. C.

Club Building

Plans have been completed and contracts awarded for the construction of a three-story and basement steel and brick club house at Thirty-second avenue and California street, San Francisco, for the Dorian Olympic Club. The architect is H. C. Baumann.

Mission Style School House

Messrs. Norberg and Edwards of Burlingame are preparing plans for a $15,000 school house for the San Bruno school district. The Mission style will be followed.

Stores and Apartments

A. W. Cornelius of San Francisco has prepared plans for a two-story class C store and apartment house to be erected in Pittsburg, California, for Grabstein Bros. of that city. Estimated cost, $12,000.

Unique Tavern for Mt. Diablo

A tavern of original and unique design will be erected on the summit of Mt. Diablo, according to present plans. The structure will be so built that it will fit into the natural contour of the mountain-top and from a distance will appear as a part of the mountain itself.

The idea originated with Arthur B. Benton of Los Angeles, architect of the famous Glenwood Mission Inn at Riverside and the New Arlington at Santa Barbara. Benton was a visitor to the mountain last month and outlined briefly his ideas as to the kind of tavern that should be erected there.

"It would be a shame to introduce any kind of a building other than one that would fit into the natural surroundings. A tavern should be built along original lines—a structure that will be allowed to wander in and about the rugged rock formations, that will lose itself in the mountain itself," he said. "The setting is superb for working out an original design."

Benton is one of the founders of the California Landmarks Club of Los Angeles.

Flower Box a Mile Long

Wilbur David Cook, landscape architect of Los Angeles, is preparing plans for extensive improvements to the property of Mr. A. G. Spalding at Sunset Cliffs, Southern California. The scheme involves more than a mile of cliff frontage that is being developed along naturalistic landscape lines. This frontage will be kept for all time open to the general public. One feature of especial interest is a flower box a mile long planted with two varieties of the mesembryanthemum which will festoon over the cliffs.

Turlock Carnegie Library

Bowen & Davis of Fresno are preparing plans for the new Carnegie library building soon to be constructed in Turlock. The building is to be of pressed brick facing, and is to cost about $10,000. The plans have been taken in charge by a committee which will send them to the Carnegie Commission for approval.

Four-Story Apartment House

Joseph Cahen, 45 Kearny street, San Francisco, has completed plans for a four-story and basement class "C" brick apartment house, to be erected on the northwest corner of Bush and Powell streets, for E. J. Greenwood. Estimated cost is $50,000.

Steel Contract Awarded

Messrs. Stockholm & Allyn, Monadnock building, San Francisco, have awarded a contract to the Mortensen Construction Company for the steel work on the theater to be erected in the Mission district from plans by Reid Bros.

Did This Really Happen?

Editor The Architect and Engineer of California:—A correction to the article in your last number with the above heading is due our host who with no ulterior motive invites a number of his competitors to a jaunt up river to Sacramento; and our arriving on time is laid more to the good behavior of the Standard engine in the boat than to any virtue of the guests, for if there is anything that was overlooked by them in making a mess of things it is not in the log of motor-boating.

In the first place, it is an accepted fact that instead of turning to and doing a share of the work the proper caper is to let the skipper do it, and so after digesting our first meal and everybody offering to wash up but nobody stirring, one of us suggested a short way of washing dishes by rinsing in salt water and straightway took all the plates out of the bucket of water and threw the silverware which lay on the bottom of the bucket overboard.

One of us had been up the river before and knew the channel. When asked if he was sure he knew where the snags were he immediately ran ashore and said, "Yes, there's one of them"—so he disqualified as a pilot as the other had as a dishwasher, leaving more work for the skipper.

One of the disadvantages of motor boating is the meals, but of this we were more than lucky, as our host abundantly supplied course dinners which would do justice to the Inside Inn, and so savagely did we gourmandize that the roughness of the swell came near turning some Inside Out on the last lap.

Being naturally by profession all in quest of the beautiful, on turning a bend in Steamboat Slough, our helmsman sights beauties on the starboard bow, and lo a couple of shapely sirens a-sporting on the bank, resplendent in not too much covering, posed in Grecian grace for a moment, while we quickly glided by to new beauties of sunset glow, autumn colors and reflections.

The theme of the competition was merely a by-product and each attained a certain pleasure in the drawings submitted except one, a grouch, who, while submitting plans, did it under protest and at the stop in Sacramento penned the following doggerel on hearing the number of architects competing:

'Tis not the Eldorado,
Nor the wake of a tornado,
That brings the rush of architects to town;
But just the merest echo,
Reflecting from the mecca,
Reporting there's a job here to be found.

Resulting from a squabble,
The natives got in trouble,
And seeking though to clear the atmosphere;
Resorted to advising,
The board in advertising,
There is something we'll be building here.

Acting on this suggestion,
The board goes into session,
And gets the program all in proper form;
By telling of the paper,
The rooms and other matter,
That nothing in the building can go wrong.

Anon they get their answers,
From men who seeking pastures,
To rear ideas in solitude the've gained;
Who then prepared the drawings,
With sighs and many yearnings,
Have sent them in to get the prize and fame.

The're architects of schooling,
Men in practice ruling,
Those who seem to think they cannot lose;
There are ones who are conceited,
Financially depleted,
Attracted by the semblance of the ruse.

Now one would hardly credit,
That men of worth and merit,
Would waste their time on such a scheme as this;
Which lacking roulette's fortune,
Or lightning's quick contortion,
Could not help in being but a mis.

The program may be proper,
The plans may all be dapper,
The human nature of the judges good;
But all in proper season,
You'll find some other reason,
Why the winning one's selected as it stood.

MORAL

Now go join the doctors,
The lawyers and the locksters,
Or any other trade where men have stood;
Be a chump no longer,
To give away your thunder,
We all should get the pay the others could.

So architects get busy,
Revise your ethics raw,
And never chase again the rainbow's glow.
For your energies creation,
Will better state and nation,
When they pay you to present the things you know.

THE GROUCH.

On board the Ione.

Oakland Architects Busy

The architectural firm of Richardson & Burrell, Albany block, Oakland, report that they have completed plans for two frame apartment houses, to cost $8,000 and $10,000 each, and to be erected on Grant avenue, East Oakland, for Sommerstrom Bros., contractors and owners.

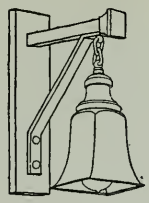
The same architects state that they are preparing plans for a four-story brick and steel apartment house to be erected in the down-town district, and a frame apartment house of 150 rooms to cost in the neighborhood of $90,000.

Plans have been completed for a one-story class "A" store building to be erected on Sixteenth street, near San Pablo avenue, at a cost of $18,000, for the First Trust Company of Oakland. Construction by day labor.

Preliminary sketches have been made by the same firm for a $40,000 moving picture theater and for a two-story steel and granite bank building for an Oakland mercantile and banking establishment, to cost $28,000.

Berkeley Apartment House

Wright & Rushforth, the San Francisco architects, have made plans for a $30,000 apartment house to be erected on Hillegass avenue, near Stuart street, Berkeley, for G. A. Mattern.



Heating and Lighting

Plumbing and Electrical Work

Automatic Temperature Regulation

By A. G. CALDWELL*

THE term temperature regulation as spoken of by architects, engineers and others in the heating and ventilating trade is the control of sources of heat automatically. This is accomplished by means of an instrument known as a thermostat, which, in connection with dampers, valves, etc., constitutes the heat regulation system.

The term "thermostat" is composed of two words, thermo and stat, both being derived from the Greek, thermo meaning heat and stat to make stand, in other words, "heat controller." The term humidostat is a word coined and actually patented by Prof. Johnson, meaning, of course, a humidity controller.

Thermostats are not a recent invention, although a **system of heat regulation** is an invention of the last thirty years. As far back as 1850 attempts were made to produce a device by which stoves and furnaces might be controlled. This device was simply a brass rod which was so arranged that the expansion of the same opened and closed the draft door.

The first successful temperature regulation system was introduced by Prof. Warren S. Johnson about thirty years ago, while he was a professor of physics in the Whitewater State Normal School at Whitewater, Wis. Prof. Johnson taught in the uncomfortable and unsanitary conditions which prevailed at that time and which all old-time teachers experienced. The school rooms were irregularly heated over a wide range of temperature from 60 to 80 degrees and always poorly ventilated. In order to relieve the conditions, when the temperature increased to the point where it became uncomfortable, windows and doors were opened and the children exposed to the draughts. On a cold winter day the thermometer would soon drop with the windows opened and the pupils, with good reason, would complain of being too cold. The result was that the teacher was very much annoyed and distracted trying to keep every one contented and the health of the pupil was endangered, at the best.

Being a precise man, Prof. Johnson realized the necessity of a temperature controlling system in the school room and he set about to devise some means of performing the operation. The result was that he invented a system whereby the desired range of temperature in each room was indicated in the basement, where the janitor was supposed to be. A thermostat, which closed an electric circuit on a rise and on a fall in temperature within a predetermined range was placed in each room and electrically connected to an annunciator in the basement.

This annunciator had two drops for each room, one marked "hot" and the other marked "cold," each pair associated with a thermostat and numbered to correspond to the rooms. Each flue from the heater had dampers similarly numbered, and these dampers had handles conveniently located. When the temperature in a room, numbered six for instance, rose to the point at which the thermostat was set, it closed the electric circuit on the high side and exposed the drop marked "hot" under number six on the annunciator in the basement, and rang a bell. The janitor was supposed to jump for the handle to damper number six and close the damper. When room number six cooled sufficiently to close the circuit on the low side of the thermometer and indicate "cold" on the annunciator, the bell would ring and the janitor would jump for handle number six and reverse the damper, and so on. This relieved the teacher from the care of the temperature and worked all right for a time, but the motive power was not always on the spot and sometimes the operator would be slumbering peacefully when the bell was ringing for more heat.

I will not touch upon all the developments of the system more than to say that in place of the janitor, compressed air was used to operate the dampers, the electric thermostat being used to control the operation of the compressed air. This system was called the electro-pneumatic system and was extremely successful because there was nothing else on the market to do this work, and

*Manager San Francisco office Johnson Service Company. Extract of a paper read before the San Francisco architects and engineers, November 3, 1915.

Mr. Caldwell's talk was supplemented by stereopticon views of the Johnson Service factory at Milwaukee, also photographs of the company's apparatus and thermostat devices.

it did the work efficiently. This system was installed in hundreds of buildings and was used until 1895.

I might relate here an incident in my early soliciting career when my headquarters were at Kansas City, Mo. As we had a good prospect at Sioux City, Iowa, I was detailed to cover it while out on a northern trip and as customary always inspected systems already installed. I was carrying as usual a model with the thermostat of the eight-inch size standard at that time. After finishing wih the prospect I looked over our list of installations and noted among others the Security building. This I discovered was close by and I took my model as it happened with me.

Instead of interviewing the engineer of the building, I took the elevator to one of the upper floors and walked into one of the offices. There to my surprise on the wall was a thermostat of huge dimensions, over two feet long with a long brass strip and two induction coils at the bottom.

Without informing the tenant who I was I told him that I had heard that a system of temperature regulation was installed in this building and presumed the large device on the wall was a part of the system. Fortunately, I had struck an old tenant who had been there a long time. This gentleman gave me a beautiful dissertation on its value, what a fine thing it was and how he knew that it had saved the owner of the building its cost many times over in fuel.

While we were talking it started to work, beginning with a noise like an electric starter on an automobile and winding up with a decided bang. My friend never batted an eyelid and after a few commonplace remarks I thanked him and departed with my model, without explaining who I was. The thought had flashed through my head after the event I have just mentioned that to show this gentleman an instrument one-fourth the size of his, and that made comparatively little noise, would be to encounter expressions of doubt that such an instrument could work, and I knew positively that the noise was too tame. To show this man our latest instrument which is less than five inches in height would cause, I am afraid, derogatory remarks as to the sanity of the company.

While Prof. Johnson patented a purely pneumatic system as early as 1885, it was not considered sufficiently perfect to put upon the market. In 1895, however, there was put upon the market the Johnson Pneumatic System of Temperature Regulation. Prof. Johnson's greatest problem was to find a power which could be easily obtained and conveyed. Compressed air seems to fulfill all the requirements, and the experience of twenty years has demonstrated the wisdom of the choice.

At the time of the invention of heat regulation, or soon after, Mr. T. J. Waters, chief engineer of the Chicago school board at that time, recognized its value and recommended and used the system in connection with his heating plans. Briefly, the idea of a central plenum chamber with thermostatically operated double dampers is due to his experience. With the later development of a double mixing damper, another type was invented called the intermediate thermostat. It is very much similar to the positive thermostat, but so designed that the damper or valve will be held in an intermediate position, in order to mix the tempered and heated air.

Personally, I am a great believer in the combination system of heating, particularly for California. This type is being installed in the new San Francisco City Hall, in the major portion of the new schools of Oakland under their last $2,000,000 school bond issue, and all of the new schools being built this year in Berkeley. Its adaptation to California climate is through its flexibility in operation. During mild cold weather, a fair amount of ventilation can be secured by the lowering of windows from the top and dispersing with the fan or blower. The radiators, which are thermostatically controlled, give off sufficient heat to take the chill from the incoming air. In schools of any size, elimination of the fan means the saving of electric current of some consequence used for the fan motor. When the colder weather comes, the windows can be closed and the fan turned on. It is not expected that any heating plant shall heat the outside air around the building. It could be done, but it would be quite expensive.

The furnace blast system is a very economical system for smaller schools.

A majority of people appreciate the fact that an efficient system of automatic temperature regulation is a good thing to have, as it provides comfort and convenience for the occupants of the building, and also increases the health of the occupant. We also claim that it is a great saving in money, by saving in fuel, cutting off as it does the heat at the desired temperature and thus eliminating the cost of wasted heat above this point.

Contract for Concrete Factory

Charles Peter Weeks of San Francisco has let a contract to Messrs. Lange & Bergstrom for the construction of a reinforced concrete factory building in San Francisco for the John Bollman Company. Building complete will cost $138,500.

Oakland Residence

Plans have been completed by Harris Allen for a two-story frame and plaster residence to be erected on Tamalpais street, Oakland, for Mr. R. L. Underhill.

New Observations on Ventilation

ACCORDING to orthodox views of architects, ventilating engineers and hygienists, as expressed by O. W. Griffith in an article in The Medical Officer (London), there are three points which must be strictly observed:

1. To provide sufficient cubical space per person, and a sufficient renewal of the air to insure its chemical purity.

2. To keep the temperature steady at about 60 degrees Fahrenheit.

3. To keep the relative humidity at 75 per cent or thereabouts.

Mr. Griffith was referring particularly to the conditions that would have to prevail in England after the present war, for he said, "when the young fellows in Kitchener's army return to civil life they will demand healthier conditions than they formerly experienced in overheated factories and badly ventilated offices."

"Now these three cardinal points," added Mr. Griffith, "are shrouded in mystery, and though they are quoted in books on housing, ventilation, on hygiene and even on physics, one never finds a reference to any experimental facts in support of them. . . . Every attempt to discover poisons—organic or inorganic—in the air of occupied rooms under normal conditions has failed.

"As our experience widens, our knowledge of phenomena deepens, though now and again a genius appears before his time, has a vivid glimpse of the truth of things, and proclaims what he sees to an unheeding world. It is nearly a hundred years since Dr. Haberdeen—a medical man—in a short communication to the Royal Society, pointed out that the reading of an ordinary thermometer is no criterion of comfort, which really depends on the rate of cooling of the body. He advocated, as a test, warming the thermometer to about 100 degrees Fahrenheit, and then determining the time of its cooling through one degree in the neighborhood of the temperature of the body. This rate of cooling he took to be the proper indication of the state of the atmosphere. His fellows gave his idea a decent burial in the transaction of the Royal Society—and his work was forgotten. But it has recently reincarnated in the mind of Dr. Leonard Hill, who independently rediscovered it and extended it to the testing of the moisture in the air as well. The instrument adapted for this purpose is called the Kata-thermometer.

"After a long and elaborate research conducted by Drs. Hill and Flack and myself, the complex part which temperature, humidity and movement of air play has been determined. Within a certain range, and keeping a proper balance between them, all three can be varied without affecting the pleasantness of the conditions. The movement of the air is, of course, more readily controlled than temperature and humidity, and that is really, I suppose, why the 60 degrees Fahrenheit and 75 per cent humidity were fixed as standards. But it is important to notice that no combination of degrees of temperature and moisture can produce comfortable conditions in absolutely still air. Herein, therefore, comes the paramount importance of ventilation. Gentle varying air motion is stimulating to the skin—this is the prosaic physiological equivalent of the popular phrase, 'Variety is the spice of life.' On a beautiful spring or early summer day the radiant heat of the sun keeps the ground warm around our feet, and the soft, gentle, refreshing breezes circulate in eddies about the body, keeping the head cool and stimulating the nerve endings in the skin. These latter are like so many little telephone exchanges, which, when thus 'rung up,' call into vital activity all parts of the system. The Kata-thermometer enables one to determine when this state of affairs obtains. It has the advantage that from its readings—taken in a few minutes—one can not only test the degree of comfort of the air, but one can also measure the humidity or the vapor pressure and the velocity of the eddies. For preserving and registering a continuous record of the comfort factor, Dr. Hill and the writer have invented an automatic electrical apparatus, called the Caleometer.

"Our observations show that to maintain the atmosphere of a room comfortable while the degree of moisture is going up—as it is liable to do when a number of persons are present—the temperature must be lowered, or the movement of the air increased. Since, however, overcrowding causes both moisture and temperature to increase, the necessity for more rapid air movement becomes greater.

"In the designing of houses, therefore, the size of the apartment must be such that a gentle air motion (as distinguished from an unpleasant draft) is sufficient to keep the air temperature and moisture from rising excessively and to preserve a standard Kata-thermometer reading. To insure this the apartments must be roomy and lofty. The point, however, can only be settled by direct observation. The question of artificial heating complicates the matter enormously, but there are some points which the kata-thermometer has decided for us.

"It is absolutely essential that the rate of cooling should be greater at head level than at floor level. One of the chief disadvantages of the coal fire is that it sometimes inverts this arrangement. There is often a cold draft along the floor on account of the drawing power of the chimney. Draft excluders at the bottom of the door, or a small

mat outside it, are the usual means adopted to cure this defect, and even when it is not completely eliminated, one can always keep comfortable by placing one's feet on the fender, so as to receive the full benefit of the radiation from the fire.

"In olden times the Chinese and the Romans kept their fire burning by a downward draft, and, I believe, the chimney passed under the floor. This, in principle, was an excellent arrangement. Heating by steam radiators (which are not radiators), and all similar ways of creating convected heat are thoroughly bad, because they produce slower cooling at head level as compared with foot level. Meanwhile we must rigorously test every new system and every new scheme. We must determine with precision the defects of the houses we have already got. The Kata-thermometer helps to do this."

Building Material Prices are Stiffening

With the increasingly bright prospects for a considerable revival in building activity next year, aided by the more or less direct effects of the European war, prices of building materials are showing a tendency to advance. Steel has for some time been going up, brick prices have strengthened, and now lumber prices are stiffening.

Several conditions are contributing to the betterment of price conditions in the lumber industry. The northern mills are reporting a shortage of logs in some instances, with general conditions such as to cause an increase of price at the mills. Fir lumber is reported as selling from $1 to $3 per M higher than sixty days ago, and an advance of $1 per M is said to be in effect on all lines shipped from Washington and Oregon coastwise to California points. Large numbers of boats have been withdrawn from Pacific coast business on account of war conditions, and if the demand is stimulated to any great extent in the near future the yards in California will have gained much more profit from leaving their stocks untouched than in selling at prices that have prevailed up to the present time. Vessels can not be built in a day and a shortage in available boats in the face of a considerable increase in the demand would result in a boost of prices for stocks on hand.

Sacramento Brick Plant Sold

The Sacramento Sandstone Brick Plant has been purchased by the Independent Brick Company, said to be one of the largest brick concerns in the country, and will spend a large sum in modernizing and enlarging the plant. It is said the company has also purchased several other smaller Pacific Coast plants, which will be operated in conjunction with the Sacramento factory.

A Busy Street

I love a busy, hustling town!
One day they put the paving down,
All nice and smooth and sweet; and then
Next day they tear it up again.
From one end of the street back to
Its other end, that's what they do;
And then they get it smooth and flat,
And give it its last loving pat,
And then there is a shrick of fear
Comes from the city engineer—
He has mislaid his monkey wrench!
And instantly they start a trench
And toss the pavement all around
Until the monkey wrench is found!
And then they tamp the dirt in tight,
And get it leveled off all right,
And surface it with hard concrete,
And make a street as is a street
By putting sand and brick on that,
And the steam roller makes it flat.
Then they pierce that pavement
through and through
To lay a line of pipe or two!
Then they repair that, and it lies
Smoothly beneath the summer skies
For, it may be, a day or two;
Then there's a sewer to run through!
Now, when some one you chance to
meet
Talks of the "busy city street,"
That's what he means, in this man's
town,
The street that's getting up and down
And rolling over that way, till
It just seems like it can't lie still.
—Judd Mortimer Lewis, in Houston
Post.

Sanitary Inspector Visits Tahoe Resorts

As a part of its campaign for improving the sanitation of summer resorts in California, the State Board of Health has recently sent its sanitary inspector, Edward T. Ross, to the Lake Tahoe region, where he made inspections of sixteen resorts around the lake as well as six resorts on the Placerville road in El Dorado county.

Insanitary conditions were found in eighteen out of the twenty-two places visited, the most common fault relating to stream pollution. In some places privies were placed directly over running streams; hog pens were found on the banks, and sewage from some resorts was flowing into Lake Tahoe or its utaries. Such pollution not only creates a nuisance, but is also a distinct menace to the health of persons who drink from these beautiful mountain lakes or streams. Besides, such pollution of streams and lakes is a direct violation of state law.

Sanitary conditions at Tahoe Tavern, Pomin's Resort, Al Tahoe Inn and at Homewood Resort met with the approval of the inspector. Instructions for improving conditions at eighteen resorts which did not come up to the required standard were given to the owners.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

Oakland Municipal Garage Records

The Oakland municipal garage was established in March, 1913, with 18 automobiles in city service. There are at present 38 machines in service according to the report of the Department of Streets. The department has assumed not only the care of these machines, such as washing, supplying with gasoline, oiling, and caring for ordinary running repairs, but has also undertaken the complete overhauling or rebuilding of the machines when they have run 10,000 miles or more. All repainting, body-building and re-upholstering is now done by the department. Complete check is kept on the use of all machines by an "In-and-Out" register; complete check is kept on the handling of the machines by the "Efficiency Marking System on Auto Drivers"; and segregated cost against each machine gives complete check on operation. An analysis of the garage statement for the year 1913-14 shows the following:

A total maintenance charge on autos of .	$17,541.34
An average charge per machine of....	501.17
An average mileage per car, miles.....	6,683
Average cost per mile (including repairs and overhauling)	0.075
Total charge for gasoline	2,864.20
Total overhead charge to machines due to shortage in charge on supplies, material and time	337.39

The average cost of $501.17 covers the overhauling of 15 cars and the repairing of 12 cars. Experience has demonstrated that economy and high efficiency requires the rebuilding or complete overhauling of a car after it has run 9,000 to 10,000 miles. This requires the rebuilding of practically every car once a year. Two men working together can overhaul a car every two weeks on an average, or an equivalent of one month for one man. To overhaul 38 cars in a year requires the full time of 3 1/6 men.

Novel Concrete Paving

An innovation is to be tried by the city engineering department in the paving of Ostrander place, Schenectady, N. Y., says Municipal Journal. This is to be paved with a seven-inch deep single course layer of concrete and will be the first real concrete street in the city. The stretch to be paved is about 450 feet long by 24 feet wide. The novel feature that has not been tried elsewhere to the knowledge of the department will be expansion joints alongside of the curb and every 20 feet running across the street diagonally at an angle of 60 degrees. That is the pavement will be divided up into diamond-shaped blocks each running the entire width of the street and along the curb for 20 feet but separate from the curb and the adjoining blocks by a space varying from one-fourth inch at the curb to three-eighths inch between blocks and filled with tar asphaltum or similar material. The reason for having these joints run diagonally is to minimize the shock of the concussion of wagon wheels as by this arrangement only one wheel would strike the joint at a time instead of both forward and back wheels together as would be the case were the joints or cracks perpendicular to the curbs. The curbs will be of concrete also and will be six inches wide by 24 inches deep.

Quantity Surveying

One is just a bit surprised to know that St. Louis is going to give the quantity surveyor idea a trial; it is not a trial by the way; they have adopted the idea. The civil engineers of that city are responsible for it. Following a campaign by civil engineers through their organization, the city assembly passed an ordinance authorizing the mayor, with the approval of the council, to appoint quantity surveyors. The number is not limited. The appointees must be skilled in building construction or estimating. They must give bonds in $10,000. Patrons of quantity surveyors, who sustain loss by reason of their negligence, incompetence or misconduct can sue on the bond any time in five years. The appointments hold for four years. The charges authorized are the fees agreed upon between surveyor and clients, until a list of fees can be prepared by the Engineers' Club, St. Louis Chapter, A. I. A., and the Building Industries Association. Supplementing the ordinance of St. Louis a state law is being prepared requiring a detailed quantity list with every architectural and engineering plant.

Woodland Residence

John H. Thomas, the Berkeley architect, has made plans for an attractive country home to be erected in Woodland for W. G. Stevens of that city. The cost is estimated at $55,000.

Gravity Chutes Fail to Stand Constant Wear

The successful conveying of concrete materials and particularly mixed concrete in pipe lines and inclined troughs or chutes has been a notable development in the last few years in concrete engineering. The various problems of size and support of pipes and troughs, shape of troughs, consistency of mixture and general procedure have been very completely solved, but how to reduce wearing of pipes and troughs is still demanding serious study. Old dredge men who have pumped mixed clay and gravel through steel pipe know well its astonishing capacity at times for cutting the best of steel into ribbons. Concrete physically is not greatly different from gravelly clay and its abrasive powers should be much the same. At any rate concrete when run or driven through chutes and pipe lines does wear them out and oftentimes does it in a very short time. The citation of a few examples will perhaps best present the condition encountered.

For example: On recent tunnel work in San Francisco, placing concrete lining by pneumatic mixer and conveyor, some interesting results of pipe wear are reported. An 8-in. steel pipe was used for conveying and 16-cu. ft. charges were forced through the pipe under 120 lbs. air pressure with velocity of 75 to 100 ft. per second. On level straight lines ordinary 8-in. flanged connection steel pipe not quite new had a life of about 6,000 cu. yds. of concrete conveyed. The same pipe on an up-grade of 7 per cent wore through first on the top. Threaded connections proved least durable; the thinning of the section by threading resulted in rapid cutting through at the joints. At bend, 4-ft. radius, ½-in. steel pipe cut through in instances in 12 hours continuous conveying and averaged only 60 hours' life.

Records of gravity conveying of concrete in open trough inclined chutes may be summarized about as follows: No. 14 gauge blue annealed steel open trough chutes have in instances cut through small holes with 1,500 cu. yds. of concrete conveyed, and there are recorded instances of such chutes having carried 20,000 cu, yds. without wearing holes.

The examples selected, it must be remembered, are purposely examples of failures. They are chosen to show the worst results likely to be experienced in wear of pipe and trough conveyors. Ordinarily the contractor will not experience anything like such adverse conditions. Were this not true these conveying methods would never have attained the extensive use that they have. When excessive wear occurs the records, though they are unfortunately very meager, indicate that it occurs because of exceptional circumstances.

As indicated by the example cited, pipe line wear is greatest at bends, at thin spots like threaded joints and on upgrades. Trough chutes cut through first at dents or bumps or where there are "soft spots" in the rolled plate. Again the character of the aggregates affects greatly the rate of wear.

Broadly speaking the statements made indicate an increased life due to relining which well repays the greater cost and weight wherever increased life will save renewal. The notion occurs that perhaps the same result could be obtained without the burden of increased weight by using manganese steel. Manganese steel plate, according to a writer in Engineering and Contracting, is now being rolled with high success and concrete workers are already familiarized with its use in shovel blades and for the stirring blades of mixers. For chutes and pipe lines for carrying concrete nothing presents greater claims for investigation than manganese steel.

Industrial and Trade Notes

H. T. James Says Pacific Coast Paint Manufacturers Can Meet Eastern Competition

MR. H. T. JAMES, general manager of the Bass-Hueter Paint Company and San Francisco Pioneer Varnish Works, manufacturers of the well-known Hueter varnishes, at the last weekly luncheon of the Home Industry League, made a few remarks in regard to the ability of the Coast paint manufacturer to compete with the Eastern manufacturer.

He stated emphatically that, as to price and quality, there was no question whatever, and that the best verification of this is the fact that the large corporations, purchasing on a basis of chemical analysis and physical tests, buy practically all their requirements from the California manufacturer.

Mr. James added, however, that it was impossible for the California manufacturer to compete with the national advertising campaign carried on by many of the large Eastern manufacturers, the volume here being limited, whereas, they virtually have the entire United States, making it impossible for the local manufacturer to spend more than the volume would warrant.

He urged that the principle of Home Industry be carried out, that it would mean, if the architects would specify home-made products or include them in

their specifications, the contractors would use them and the property owners would insist upon obtaining home manufactured paints and varnishes, the doubling of their plants, the employment of additional labor and the distributing of so much additional moneys that are now sent East.

"The ability of the California paint and varnish manufacturers to meet all competition," said Mr. James, "can be readily demonstrated if they are given the proper consideration. They have the equipment and the overhead expense is no greater, if as great, as their Eastern competitors. All they require is the support, and this can be obtained by the co-operation and loyalty of our home purchasers.

"Paint problems are of endless variety. Practical and laboratory experiments are continually resulting in better paints for all purposes, and the trend happily is towards high quality on the part of the large manufacturers. Standards are set very close to perfection and the endless experimenting is evidence to this effect. Paints are now made scientifically for every known requirement. And where we are accorded the proper consideration we invariably secure our proportion of the business."

Concluding his talk, Mr. James predicted a notable business revival next year. "With us," he said, "business is extremely good right now."

Los Angeles Builders' Exchange

The officials and members of the Los Angeles Builders' Exchange are planning a reorganization of that association which portends great benefits and a general improvement of conditions for all interests in the building industry. It is planned to make the Builders' Exchange the central organization of an association to be composed of smaller units representing every interest in the building industry, including general contractors, material dealers, sub-contractors and all of the crafts.

Mr. Walter Scott Risk has been selected as the new secretary of the Builders' Exchange and will devote his energy to carrying out the reorganization plans.

Advertising Saves Lumber Industry

Manufacturers of redwood will doubtless be interested in the following story of how a falling off in the cyprus lumber industry was ameliorated by an advertising campaign, setting forth the uses of this kind of lumber. George E. Watson, secretary of the Southern Cypress Manufacturers' Association, states that from 1908 to 1913 there had been an increase in the production of cypress lumber of about 47 per cent. Just before this period, he said, a decline in the sales of cypress set in. The factories had found it possible to buy other lumber suited to their requirements at lower prices. There was no legal method of decreasing the production of cypress lumber, and demoralization of the trade was threatened.

A campaign of advertising to educate the public to demand cypress had been carried on with the result that this wood probably had suffered smaller decline in volume of business and prices than had other wood, he said.

United Steel Sash

The Trussed Concrete Steel Company of Youngstown, Ohio, has just issued a volume containing 128 pages, size 8½x11, upon United Steel Sash. The matters covered are the various types of sash with their application in building construction. First, the features of steel construction are covered, the strength, weathering, workmanship, hardware, glazing and utility of the sash. The book is extensively illustrated with diagrams, sections, plans and elevations showing construction and application. The different types are standardized on the unit system which is explained by diagramatic tables, very valuable to the architect in planning.

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Architect Lichtenstein Plays Golf

Final matches in the annual tournament of the Lincoln Park Golf Club of San Francisco resulted in the championship being awarded to Milton Lichtenstein, who defeated P. A. Moulton by the count of 6 up and 4 to play. Lichtenstein put a fine brand of golf on record, his short game being especially commendable.

How to Apply Water Glass on Concrete Floors.

Wash the floor thoroughly with clean water, scrubbing with a stiff broom or scrubbing brush, removing all dirt and loose particles. Allow the surface to dry, and as soon as dry apply a mixture or solution of 1 part water glass (sodium silicate) of 40° Baumé, and 3 parts to 4 parts of water, depending upon the porosity of the concrete. The denser the concrete, the weaker the solution required. Stir well, and apply this mixture with a brush. A large whitewash brush with long handle will be found most economical.

If this solution is sufficiently thin, it will penetrate the pores of the concrete. Allow the concrete surface thus treated to dry. As soon as dry, wash off with clean water, using a mop. Again allow surface to dry and apply the solution as before. Allow to dry and again wash off with clean water, using a mop. As soon as the surface is again dry, apply the solution as before. This should fill all the pores and the third coat will entirely flush all over the surface. If not, apply another coat as above.

The sodium silicate which remains on the surface, not having come in contact with the other alkalies in the concrete, is readily soluble with water and can therefore be easily washed off, thus evening up the color and texture of the floor. That which has penetrated into the pores, having come in contact with the other alkalies in the concrete, has formed into an insoluble and very hard material, hardening the surface, preventing dusting and adding materially to the wearing value of the floor.

Status of Hetch Hetchy Water Supply

Good progress is being made by the city engineer's department of San Francisco in the development work in connection with the Hetch Hetchy water supply system.

Plans and specifications have been completed for the remaining 58 miles of railroad to connect the dam site to a point on the Sierra Ry., near Chinese Camp. Nine miles of this road already has been constructed and is now being used in conveying material to the place where initial work in the Hetch Hetchy will begin. The U. S. government has approved of all the

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city's plans as to work, and in this respect matters are most satisfactory.

The board of public works has requested the supervisors to set aside $40,000 to provide funds for clearing the floor of the valley of timber and brush preparatory to flooding it with waters which will be held back by the diverting dam.

New Home of the General Electrical Construction Company

The accompanying photographic plates show the new home at the corner of O'Farrell and Mason streets, San Francisco, of the General Electrical Construction Company. Here will be found "everything electrical," and Xmas shoppers will find "just what they've been searching for." The location is one of the best in the city and the arrangement of the store and display counters could not very well be improved upon. The offices of the company are on the mezzanine floor. The General Electrical Construction Company is still in the contracting business and its wiring department is in the hands of competent electrical engineers who are always at the service of the architect, owner or builder.

A Practical, Economical, Odorless Gas Heater

The Cole Heater Sales Company has taken over the account of Messrs. Fisher & Klauser, who have been handling for some time the Cole floor, wall and fireplace heaters. The new distributors retain the old offices in the Lick building, with an Oakland office at 1764 Broadway.

The Cole gas heater is considered one of the best gas heaters on the market and, unlike many heaters of this type, it is absolutely odorless. Each heater will heat 4,000 cubic feet at a cost of only one cent an hour, a price that should appeal to the most conservative. The heaters may be installed while the house is being built or after it is finished. The ventilation is said to be perfect, fresh outside air being drawn through the combustion chamber of the heater. The heater is practicable not only for residences, but for apartments, flats, hotels, rooming houses, churches, offices and factories.

A Merry Xmas for the "Kiddies"

The poor children of San Francisco are to be amply remembered this Christmas. The Daily News is planning a monster Christmas tree for the youngsters and the distribution of presents to each one attending the celebration. It is planned to gladden the hearts of several thousand little chaps and lasses. The big tree will be erected at Arcadia Pavilion, with myriads of lights, new stockings of candy, oranges and nuts, toys, warm clothing and many other things so necessary, as well as so dear to the little tots at the Yuletide season. The largest concerns in San Francisco have contributed their services and presents, and a "Send a Dollar" campaign, instituted by the Daily News, has brought in many contributions from folks and families more favored by Dame Fortune.

Bands and orchestras will play; actors and actresses of national repute will perform, and an effort will be made to give the little folks the time of the year at the big pavilion. None will be overlooked. Committees from churches and societies will be on hand to take care of the little guests, and the joy of the season will be theirs.

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Hotels for Yosemite Park

A radical change in the management of all National parks, which will result in bringing these great playgrounds closer to the people in general by affording a better and more uniform system of transportation, hotel accommodations, means of rest and recreation, has recently been approved by the Department of the Interior. Hereafter the Interior Department will deal with only one concessionaire in each park.

The Yosemite Park concession has been granted to the Desmond Park Service Company, a San Francisco corporation, the moving spirits of which are D. J. Desmond and Lawrence W. Harris, and vast plans for the improvement of the accommodations in the Yosemite have been made.

The new concessionaire in the Yosemite will begin next spring the construction of an immense hotel in the main village—Desmond Yosemite Valley Camp, at the foot of Yosemite Falls. Louis C. Mullgardt of San Francisco is now preparing the working plans. The hotel will cost $150,000.

In addition to this hotel, another hotel will be constructed on Glacier Point, to take the place of the old hostelry that now occupies that eminence.

Valuable Books on "Armco" Ingot Iron

The American Rolling Mill Company of Middletown, Ohio, has recently published a very useful book, "Armco Iron Rust Resisting Products," in which are illustrated and described most of the important Armco products made at the Middletown factory and quite a number of those produced by other manufacturers. The number of products that are now made largely of this material is surprisingly large.

The same company has also just had printed a new edition of "Defeating Rust," which booklet quite fully covers the inception, development, qualities and uses of Armco (American Ingot) Iron, it having been quite extensively revised as compared with the edition published a year ago.

These books give some very useful information with regard to Ingot iron which is now assuming an important place in construction which is intended to be lasting.

The American Rolling Mill publications may be had, on request, of the American Rolling Mill Company, Middletown, Ohio.

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Steel Price Advances May Affect Construction Next Year

The serious effect which the continued rise in the price of steel and all steel products, will have on both the cost of construction work and the possibility of projected work going ahead next year, is causing concern among the architects and engineers. Prices of other materials are also advancing rapidly and while this at first thought means better times ahead for the manufacturers and supply houses, there is danger that prices will soar to such an extent that the cost of construction work will cause owners to hold off projects which they are now intending to carry forward. This feature of the situation appears so serious that it is deemed worthy of comment by the engineering publications of the country. Engineering Record, which is consistently conservative, in its current issue sounds a "Call to Action," as follows:

"Civil engineers and contractors throughout the country have been watching the phenomenal advance in steel-mill activity without realizing that they are soon to be actors in the great drama and not merely spectators. The steel industry will in 1916 play a most important part in the cost and execution of all engineering work. Already prices have increased greatly. The trend is still sharply upward and the rounding of the curve is nowhere in sight. On the contrary, the awakening of the country's domestic business, coming at the same time as the large, and always increasing, volume of war orders, may send the market considerably higher. If the war should end quickly, the situation would change at once, but the safer course is to assume that hostilities are to continue.

"Nor is the cost of next year's work alone at stake. The steel industry may determine whether work is to be done at all. The reason is on the surface. Already many mills are sold up to capacity for three or four months, while not a few are committed for their entire output until the second half of next year. That presages not only shortage of the actual steel materials entering into construction—such as shapes and reinforcing bars—but of plates, angles, rounds and other products essential to the manufacture of contractors' equipment. Already one manufacturer reports that the best delivery he can get on rounds for car axles is three months, while fifteen to twenty weeks is the quoted delivery on other finished steel products. Fortunately, equipment and machinery manufacturers are fairly well stocked, but the fabricated and partly fabricated equipment in hand was probably never lower. The first spring rush will consume the supplies now awaiting fabrication, and then will come delays that may be serious enough to cause the postponement of many an important and pressing job.

"In the structural field reports from Pittsburgh show that the fabricating shops, too, have felt the pressure, due, of course, largely to the domestic revival. Practically all of them are filled up for the next four to six months, except as to heavy shapes. Some relief is possible from increases in capacity, but this is not expected to make any material difference.

"It is the engineer's turn to think fast. The first man to let contracts for next year's work will be the most certain to have them executed and will get the lowest prices. There should not be an instant's delay in starting the machinery moving toward the closing of the contracts.

"The contractor no less than the engineer needs to understand the gravity of the situation. He would best be in close touch with the equipment manufacturers. He is not likely to commit himself for a new plant until contracts are in hand, but when time for action comes, he must know where he can get what he needs, and how soon.

"The manufacturers are fully awake to the conditions. They are doing all they can to secure adequate stocks of steel, but belated orders for equipment are almost certain to be accepted only on long delivery terms or to be refused. Then, too, the prices on them will necessarily be higher than for early purchases, though higher price levels must be expected even for the first deliveries.

"This is not a time for speculation or procrastination. Where work is authorized, engineers owe it to their clients, municipalities, companies, to let the work just as soon as possible. Where work is imperative, but plans are not yet made or authority secured, the necessary machinery must be started at once. The penalty for delay promises to be severe."

Los Angeles Architects Meet

The regular meeting of Southern California Chapter of Architects was held Tuesday evening, December 14th.

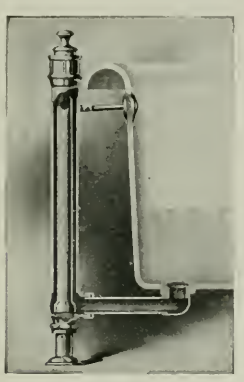
President S. Tilden Norton announced the appointment of a new City Planning committee, composed of Henry F. Withey, D. C. Allison, A. C. Martin, C. F. Skilling and R. D. Farquhar.

Mr. George C. Collins, representative of the Spencer Turbine Cleaning Company, and an expert on vacuum cleaning, gave an interesting talk on "The History and Development of Vacuum Cleaning." His address was illustrated with stereopticon views.

Clean Water for Every Bather

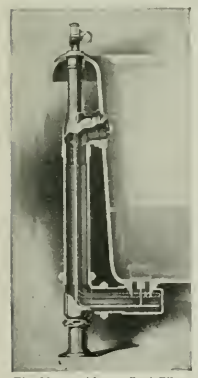
By B. F. BLAIR

AS illustrations usually add much to interest, clearness and conciseness, there are shown herewith four cuts which tell at a glance a most important story about an advance in sanitation.



Two illustrations above are ordinary stand-pipe wastes for baths and lavatories.

This waste consists of a nickeled tube standing vertically outside the bath tub or lavatory—connected with the drain in the bottom of the fixture. An inner brass tube is provided, and when released and lowered it rests in a "seat" below the opening that comes from the fixture.

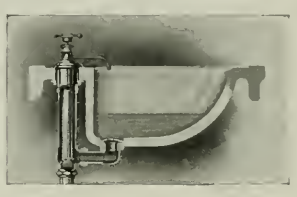


The Hajoca No. 10 Bath Waste insures clean water for every bather

It is obvious when this tube is "seated" and water is drawn in the fixture, that the water will fill the connecting pipe between the outlet of the fixture and the "seat," and will also rise between the outer and inner tubes to the same height that it rises in the fixture. Consequently when the inner tube is "unseated" and waste water is discharged, particles of soap, grease and dirt adhere to the connecting pipe. When clean water is drawn for the next bather and the tube is "seated" to retain it, this residue from the previous user is also shut in, to be dislodged by the "clean" water, and float on its surface—certainly not very sanitary, and decidedly unpleasing to the thought as well.

Upon closer inspection, this residue would be found to contain not only grease and dirt, but also mucous membrane, particles of skin and dangerous germs. In both private and public installations, such wastes are a menace to health and cleanliness, and are likely to prove a fertile source for the transmission of diseases.

Let us turn to something better.



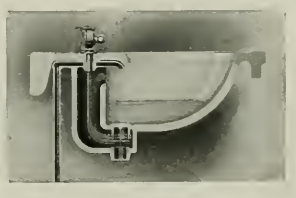
This type of stand-pipe waste has proved a menace to health and is reckoned by sanitarians as a disease-spreader

The illustrations below show bath and lavatory wastes considered by American sanitarians and health officials as marking a new era in sanitation, as they overcome all objections to the common bath and basin wastes. They represent some of the excellent work done by Haines, Jones & Cadbury Co. in advancing the cause of sanitary plumbing. These wastes are known as the Hajoca No. 10 Bath and Basin Wastes.

A brass rod runs through a single tube to the opening in the tub, connected with a stopper.

This operates *directly in the tub* by means of a simple lever on top of the tub. By one throw of the lever the stopper is dropped down in position, sealing the outlet of the tub.

The bath-water is received and held in the *tub only*. There is no backing-up of the water in pipes or tubes. By reversing the lever the stopper in the tub is raised, and every particle of waste-water is discharged. The next water received is just as clean and pure as the tub which receives it. Not one particle of residue from a previous bather can back up into the tub to contaminate the clean water.



This is the Hajoca No. 10 Basin Waste, similar in construction and operation to the Hajoca No. 10 Bath Waste, and having the same unique and health-protecting advantages

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Praise for Sanitary Kitchen Sink

W. J. Dodd, a Los Angeles architect, has used the "Help-Her" Sanitary Sink in a number of his houses with most gratifying results, as indicated by him in a letter to the Improved Sanitary Fixture Company, 612 Metropolitan building, Los Angeles, manufacturers and distributing agents of the sink. The letter follows:

April 26, 1915.

Improved Sanitary Fixture Co.,
612 Metropolitan Building,
City.

Gentlemen: I am glad to say that I used one of your "Help-Her" sinks in my new residence, and it proves to be of greater convenience than I expected. The cook is quite enthusiastic about it as it materially helps her to do her work, particularly in the preparation of vegetables.

Since my satisfactory experience, I have recommended the sink to my clients.

Very truly yours,
(Signed) W. J. DODD.

Another letter equally as strong came unsolicited from C. C. Rittenhouse, practical designer and consulting architect, 388 Wilcox building, Los Angeles:

Improved Sanitary Fixture Co.,
612 Metropolitan Building,
Los Angeles, California.

Gentlemen: Have been using your "Help-Her" sink in my home for six months, and have also put one in my daughter's home.

They are very satisfactory and convenient, and I shall recommend them to my clients. They do save time and work and prevent grease from entering the drain-pipe. The principle seems to be correct, and in practice, accomplishes the purpose intended, entirely obviating the necessity of a special grease trap or cleanout, as is required under some city ordinances.

Yours truly,
(Signed) C. C. RITTENHOUSE.

Reliable Contractors

Writes a leading Los Angeles architect: "It seems to be overlooked by many owners that it is often as dangerous to employ contractors by competition and force them to execute a contract that is a hardship for them, as it would be to employ in the same way a doctor or a lawyer. The service to be rendered can vary much and still be within the strict terms of the contract. I say, then, select a builder as you would a lawyer for the service he is to render, and agree on his remuneration, obtaining a willing enthusiastic service.

"Look well into his record, his ability to purchase, to take advantage of all cash discounts, his organization, equipment, and his method of handling work. See if he uses up-to-date management in his scheduling of jobs and in the fabrication as well as the manufacture of parts in his mill. All these things are of more importance than the price he quotes, for no bond, no guarantee, no promise by any incompetent contractor can make good his failure in these essentials."

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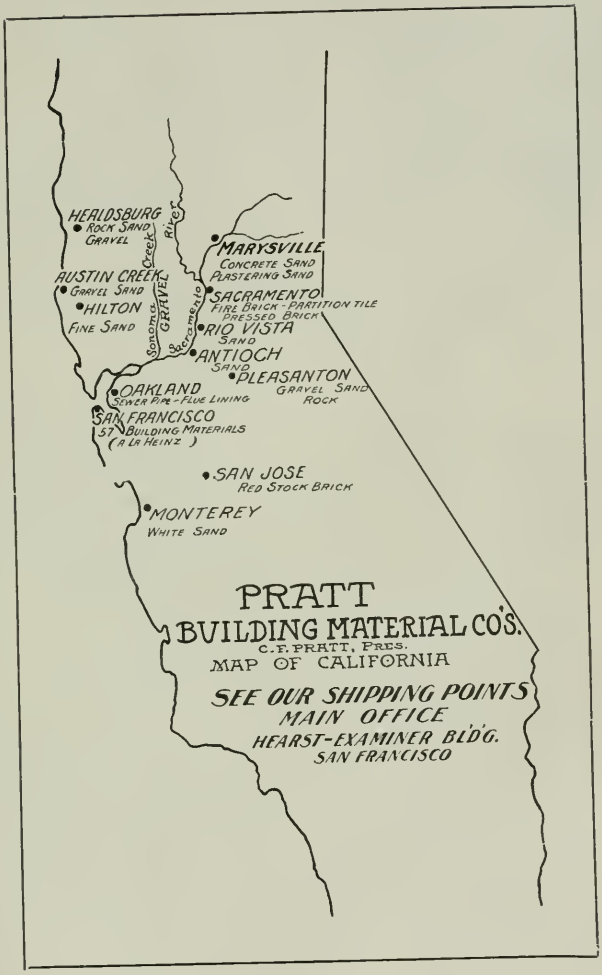
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Booklet on Waterproofing

The Sandusky Portland Cement Company, with factories at Bay Bridge (Sandusky), O.; Syracuse, Ind.; Dixon, Ill., and York, Pa., recently published a Medusa Waterproofed White Portland Cement catalogue, and a copy will be mailed on request to those interested.

This booklet is the first one issued by the Medusa company regarding Medusa Waterproofed White Portland Cement, and the information contained therein regarding the use of this material is unusually complete. According to the booklet Medusa waterproofing is especially suitable for building blocks, cement plastering, roofing tile, cellar walls, cistern and reservoir linings, conduits, sewer pipe, elevator pits, and in a multitude of other uses in which resistance to percolation of water is required. Quoting from the company's literature, we are told that "a trial will convince cement users that Medusa waterproofing is the only true preventive of dampness in concrete.

"Medusa is specified by the most eminent architects and engineers in the United States and Europe, and is rapidly displacing the old-time paints and coatings formerly used to prevent the penetration of water into concrete."

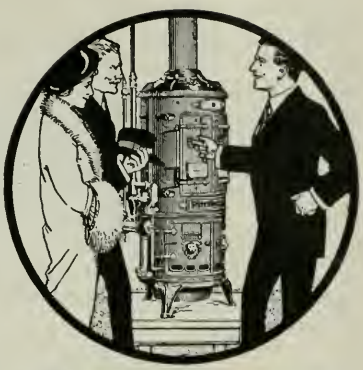
Freear Takes In a New Line

Geo. H. Freear is doing things these post-Exposition days. He is not satisfied with representing David E. Kennedy Inc., with its manifold cork tiling interests, but he has also corralled the California territory for the Armstrong Cork Co.'s tile, including the well-known Lin-o-tile. In addition he announces some new products of the David E. Kennedy, Inc., including an underflooring which will not rot, called Nalecode. This is a mineral compound which can be poured on top of structural floors and roof slabs, thus forming a base on which wood floors, linoleums, roof tile, slate and metal roofs can be securely nailed without the expense of sleepers, wood underflooring, nailing strips or sheathing.

In passing, it may be mentioned that Mr. Freear has moved back to his old quarters in the basement of the Sharon Building, under the Contractors' Exchange.

Removal Notice

The Hauser Reversible Window Co. announce that they have removed their office and show rooms to 157 Minna street, east of Third street, San Francisco, and in connection therewith, have established a factory for the production of their Sheradized Steel Reversible Window Fixtures, to fill their constantly increasing orders.



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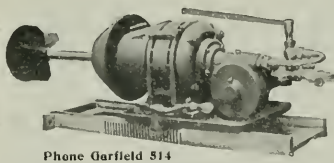

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Some Facts About Pioneer Roofing and the Big Plant at Los Angeles

Pioneer Roofing has been used on the roofs of the following well-known buildings, among hundreds of others, in San Francisco and vicinity:

Enterprise Foundry Co., South San Francisco.

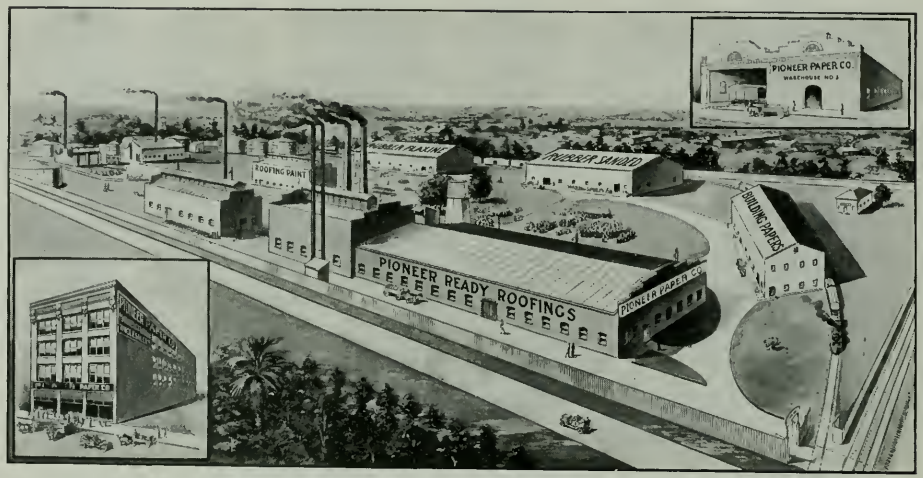
Pacific Foundry Co., 18th and Harrison Streets, San Francisco.

State Piers Nos. 18, 24, and 37 on San Francisco waterfront.

New building of Pacific Telephone and Telegraph Co. at Colma.

Griffin & Skelley warehouses, San Francisco.

San Francisco Normal School.



Factory of the Pioneer Paper Company at Fifty-fifth and Alameda Streets, Los Angeles, where the well-known Pioneer Roofing and Pioneer Building Papers are produced. This plant occupies over nine acres in addition to the Company's large building and general office at 247-251 South Los Angeles Street, as well as branch warehouses in San Francisco and other localities.

Horn & Co., 40 Drumm Street; also Machinery Hall, Educational, Food Products, Agricultural and Manufacturers buildings, P. P. I. E.

The Pioneer Paper Company had a very attractive exhibit at the Panama-California Exposition and was awarded a gold medal, the highest award made by the Exposition.

W. G. Hunt is president of the Pioneer Paper Company; H. M. Eichelberger, secretary and treasurer; Wm. Henry is manager of the Roofing Department. H. H. Linton is San Francisco manager, with offices in the Examiner building.

Something About the Big Plant of the Pioneer Paper Company

THE PIONEER PAPER COMPANY was established in Los Angeles in 1888 and from a very small beginning the company has grown until their manufacturing plant at Fifty-fifth and Alameda streets, that city, now covers more than nine acres, in addition to which they have a five-story and basement steel and concrete building on Los Angeles Street where their general offices are located and warehouses in different sections, as well as an office and warehouse in San Francisco.

The growth of the company has been steady and consistent. Originally their field was confined pretty closely to Los Angeles and from this they gradually reached out to other sections of California, finally invading the San Francisco field, and then working out over other states and territories. Today they are building up an extensive trade with several South American and Central American countries, as well as Australia, Japan and the Philippines, etc.

The Pioneer Paper Company's principal product is Pioneer Roofing, made in a number of grades and weights, including Rubber Sanded, Rubber Flaxine, Asbestos, Silveroid (Silver Grey in color), Ready Rock Asphalt, and in addition to these they also manufacture Pioneer Insulating Paper, Asphalt Felt, Structural Paint, etc. The company has always made it a policy to employ the most expert workmen that could be found, and from their uniformly fair policy of treating their employees, have been enabled to obtain the most loyal co-operation. The manufacture and application of roofing is a business that requires men trained in all of the technical knowledge and who have studied the business in its every detail. This of course is in addition to the necessity of supplying good materials, as good roofing cannot be made from poor materials. That the Pioneer Paper Company have been very successful in keeping up the quality of their Pioneer Roofing is shown by the fact that it has enjoyed a constantly increasing sale for over a quarter of a century.

Letter from the G. E. Witt Company

Editor The Architect and Engineer of California:

We notice with surprise an advertisement of the American Standard Oil Burner Company of Oakland, in which the Witt Rotary Burner is grouped with others, as an infringement on a patent for an open cup centrifugal atomizer, which, it is asserted, is owned and controlled by the advertiser by virtue of patent issued October 26th, 1915.

This claim is so wild and vague that it hardly needs attention, but we may state that this principle is thoroughly covered in Patent No. 1162120 issued to the G. E. Witt Company November 30th, 1915. This is not a basic patent, but an improvement on the open cup principle, which we find was covered by patent issued to J. S. Klein, April 26th, 1892, No. 473759, and another to A. H. Eddy, June 11th, 1895, No. 540650, both of which, it is needless to say, have expired.

When an advertiser comes out in a public medium and makes assertions like these he should be sure of his ground, or he may be certain it will bring him into contempt and ridicule with all fair-minded men.

We stand by our patent and are more than willing to give full guarantee against any possible suit for infringement from said adviser or any other party, who may imagine that he has rights.

Respectfully yours,
G. E. Witt Co., Inc.,
By C. W. Vaughn, Vice-Pres.

San Francisco Apartments

Milton Lichtenstein, 111 Ellis street, San Francisco, has completed plans for a three-story and basement class "C" apartment house to be erected on Eddy street, near Jones, San Francisco, for Mr. A. Selig, and to cost approximately $15,000.

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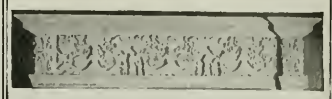

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THE DAHLSTROM PRODUCTS are made right in every particular, and prove not only a source of satisfaction from the viewpoint of excellence in unequaled finish, but the added and greater service of standing up under the severe tests of the two greatest destructive forces known to mankind — **FIRE** and **TIME.**

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SAN FRANCISCO PRICES

Common Red Brick, $9.00 per M, ex. cars.
No. 1 Pressed Brick, $35.00 to $40.00 per M; Wire cut, $35.00 per M.
No. 1 Red Pressed Brick, $20.00 to $30.00 per M.
Red Stock Brick, $14.00 to $16.00 per M.
California Portland Cement, C/L $2.30 per bbl.; L.C.L. $2.55 per bbl.
White Cement: Atlas, $6.00; Medusa, $6.00 per bbl.
Sand and Gravel mixed, 70c per ton, F. O. B. cars.
Sand (washed, screened river sand) 65c per ton, F. O. B. cars.
Bank Sand, $1.00 per cu. yd.
Roofing Gravel, $1.40 per ton.
Crushed Rock or Gravel, 75c per ton.
Red Roofing Tile, $22.00 to $25.00 per square, laid.
Brick Lime, $1.35 per bbl., C/L.
Finish Lime, $1.50 per bbl., C/L.
Hardwall Gypsum Plaster, $11.00 per ton, carload; 1150 per ton, ex. warehouse.
Oregon Pine, Rough Common, 1 x 3 to 1 x 10, $13.00.
Oregon Pine, Rough, 2 x 3 to 2- 12, $15.00.
Oregon Pine 1 x 4 T. & G. Flooring, No. 1, $31 per M; No. 2, $28; No. 3, $24.
Oregon Pine T. & G. Ceiling, No. 1 and 2 mixed, $26 to $28.
Redwood, Rough Common, 1 x 4 and up, $20.00.
Redwood, Rough Common, 2 x 3 to 2 x 10, $20.00 to $22.00.
Redwood Rustic, No. 1, $35.00; No. 2, $32.00.
Redwood Ceiling, No. 1, $29.00; No. 2, $26.00.
Redwood Shingles, No. 1, $2.40 full count.
Red Cedar Shingles, Star-A-Star, $2.40 full count.
Pine Lath, $2.40 per M.
Metal Lath, 13 to 25c per yd., according to quality.
1 x 3 Oak Flooring, Q. S. Clear, $116.00 per M; Select $75.00 per M.
½ x 2½ Oak Flooring, Q. S. Clear, $96.00 per M; Select, $74.00 per M.
1 x 3 Maple Flooring Clear, $71.00 per M; Clear White, $85.00 per M.
White Lead in Oil, 8¼c per lb.
Dry Red Lead, 8c per lb.
Boiled Linseed Oil, 74c gal. Raw Linseed Oil, 72c gal.
Turpentine, per gallon, 63 to 70c in bbls.
Dry Shellac, 35c per lb., variable.
Hyloplate Blackboard, 25 to 35c per foot, installed.
Composition Flooring, 25 to 30c per foot, laid.
Genuine Slate Blackboards, 40 to 50c per foot, erected.

LOS ANGELES PRICES

Common Red Brick, No. 2, $4.50 per M.
Clinker Brick, $9.00 per M.
Pressed Brick, $35.00 per M.
Enameled Brick, $65.00 per M.
Red Roofing Tile, $12.00 and $15.00 per square (not laid).
White Cement, $6.00 per bbl.
Portland Cement, $2.30 per bbl.
Lime, $1.50 to $1.75 per bbl.
Hardwall Plaster, per ton, $9.90 ex. whse.
Oregon Pine, Rough Common, 1 x 3 up, $19.00 to $22.00 per M.
Oregon Pine, Rough Common, 2 x 3 up, $17.00 to $21.00 per M.
Oregon Pine Flooring, 1 x 4, No. 1, $40.00; No. 2, $35.00; No. 3, $22.50 per M.
Oregon Pine Ceiling, 1 x 4, No. 1, $36.00; No. 2, $31.00.
Redwood, Rough Common, $20.00 to $24.00.
Redwood Rustic, No. 1, $38.00; No. 2, $33.00 per M.
Redwood Ceiling, 1 x 4, No. 1, $33.00; No. 2, $28.00 per M.
Redwood Shingles, 4 bdls. to M, No. 1, $2.25; No. 2, $1.75.
Red Cedar Shingles, 4 bdls. to M, Star-A-Star, $2.75.
Pine Lath, 1½ in. x 4 ft., $3.25 per M; 1⅝ in. x 4 ft., $3.65 per M.
White Lead in Oil, 8½c per lb.
Red Lead, dry, 8½c per lb.
Raw Linseed Oil, bbls., 65c gallon.
Boiled Linseed Oil, bbls., 65c gallon.
Turpentine, bbls., 63 to 70c. gallon.
Crushed Rock and Gravel, $1.65 per yard.
Sand, 85c per yard.

SACRAMENTO PRICES

Common Brick, $7.00 per M, C/L.
Pressed Brick, Wire Cut, $30.00 per M, C/L
Portland Cement, $2.40 per bbl. carloads.
Crushed Rock and Gravel, 85c per ton, ex. cars.
Sand, $1.00 yd. on cars.
Roofing Gravel, $1.50 per ton.
Lime, $1.35 bbl.
Hardwall Plaster, $13.00 per ton, ex. whse.

STOCKTON PRICES

Common Brick, $7.75 per M, del.
Face Brick, Wire Cut, $31.00 per M C/L.
Cement, $2.40 per bbl., C/L.
Crushed Rock and Gravel, 90c ton.
Sand, 90c.
Roofing Gravel, $1.50 per ton.
Lime, $1.35.
Hardwall Plaster, $13.00 ex. whse. per ton.

FRESNO PRICES

Common Brick, $9.50 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.84 per bbl., C/L.
Crushed Rock and Gravel, $1.35 per ton.
Black Face Brick, $25.00 per M—F. O. B.
Sand, $1.00 per yd., del.
Roofing Gravel, $1.85 per ton.
Lime, $1.50 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

BAKERSFIELD PRICES

Common Brick, $9.00 per M, del.
Face Brick, Wire Cut, $37.00 per M, C/L.
Cement, $2.77 per bbl., C/L.
Crushed Rock and Gravel, $1.80 per ton.
Sand, $1.00 per yd., del.
Roofing Gravel, $2.00 per ton.
Lime, $1.50 per bbl.
Hardwall Plaster, $15.00 per ton, ex. whse.

NORTHERN CALIFORNIA POINTS

Common Brick, $11.00 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.65 per bbl.
Crushed Rock and Gravel, 85 to 90c per ton, C/L.
Sand, $1.00 per yard.
Roofing Gravel, $1.50 per ton.
Lime, $1.40 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

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